THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. II. OF VOL. II., 1919.
No. 5002. Vol. CXCVII. LONDON, SATURDAY, JULY 12, 1919. Pp. 104—Price 10d.

BY W. SOLTAU FENWICK, M.D.

DYSPEPSIA: Its Varieties and Treatment.
Octavo, 455 pages. 13s. net.
W. B. Saunders Co., 9, Henrietta-street, W.C.2.

CANCER OF THE STOMACH.
362 pages. 10s. 6d.
ULCER OF THE STOMACH AND DUODENUM.
392 pages. 10s. 6d.
J. & A. Churchill, 7, Great Marlborough-street, W.1.

Now Ready. Price, Cloth, 2s. 6d. net (postage 3d.).

OTITIS MEDIA
(MASTOID DISEASE).
SAVING THE HEARING OF THE DISCHARGING EAR WITH PERFORATED DRUMHEAD.
By CHARLES J. HEATH, F.R.C.S. Eng.,
Consulting Aurist, Metropolitan Asylums Board; late Surgeon, Throat Hospital, Golden-square, London.
"In his book Mr. Heath gives us a new pathology in Otitis Media. ..... His work is already widely known, and this publication of his will carry conviction that the old pathology and the antiquated methods of treatment are finished, and that a new era has dawned in aural surgery. ..... It is a work which every medical man should read and possess, and which all education authorities should consult."—MEDICAL WORLD.
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C.2.

Quarto, Cloth. 7 Coloured Plates and 75 Illustrations. 21s. net.
(Postage 6d. extra.)
THE BIOLOGY OF THE BLOOD CELLS.
WITH A GLOSSARY OF HÆMATOLOGICAL TERMS.
By O. C. GRUNER, M.D. Lond.
"Has no rival in the English language. Indeed, we doubt whether a similar volume exists in any language."—BRITISH MEDICAL JOURNAL.
Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd

BY LIEUT.-COL. ROBERT HENRY ELLIOT, M.D., B.S. Lond., D.Sc. Edin., F.R.C.S. Eng., I.M.S. retd.
GLAUCOMA:
A HANDBOOK FOR THE GENERAL PRACTITIONER.
"An excellent summary of the subject in small compass."
—BRITISH JOURNAL OF OPHTHALMOLOGY.
Just Published. Pp. xi. + 57. With 19 Illustrations. Demy 8vo. 4s. net; post free, 4s. 4d.

GLAUCOMA:
A TEXT-BOOK FOR THE STUDENT OF OPHTHALMOLOGY.
Just Published. Pp. xvi. + 546. With 158 Illustrations.
Demy 8vo. 25s. net. Inland postage 6d., abroad 1s.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.
Incorporating the Hunterian Lectures delivered before the Royal College of Surgeons of England, February 19th and 21st, 1917.
Pp. xii. + 91. With 45 Illustrations.
Royal 8vo. 7s. 6d. net. Inland postage 5d.
H. K. Lewis and Co. Ltd., London.

SCLERO-CORNEAL TREPHINING IN THE OPERATIVE TREATMENT OF GLAUCOMA.
Second Edition. 1914. Demy 8vo. 7s. 6d. Inland postage 5d.
"The book should be carefully studied by every ophthalmic surgeon."
—THE LANCET.
"The book ought to take a foremost place in ophthalmological literature."—THE PRACTITIONER.
George Pulman and Sons Ltd., London.

Second Edition, Enlarged. Crown 8vo. 7s. 6d. net.
With 31 original Photographs and 150 special Prescriptions.
TREATMENT OF DISEASES OF THE SKIN.
By KNOWSLEY SIBLEY, M.D. Camb.
London: Edward Arnold, 41 and 43, Maddox-street, W.1.

Demy 8vo. 412 pages, 12 Plates, and 122 Illus. Cloth. Price 10s. 6d. net.
EYE, NOSE, THROAT, AND EAR.
A Manual for Students and Practitioners.
By JAMES FORREST, M.B., Ch.B. Edin.
Henry Kimpton, Medical Publisher, 263, High Holborn, London, W.C.

SAUNDERS'
NEW
BOOKS.

See Saunders Advertisement on Page 3.

Now Ready. Demy 8vo. Pp. vi. + 316. With 130 Illustrations.
Price 15s. net.
INJURIES TO THE HEAD AND NECK.
By H. LAWSON WHALE, M.D., F.R.C.S.,
Capt. R.A.M.C. (T.F.), Surgical Specialist to No. 53 General Hospital, B.E.F., &c., of the Queen's Hospital, Sidcup.
With Preface by Col. F. F. BURGHARD, C.B., M.D., M.S., F.R.C.S.
Baillière, Tindall & Cox, 8, Henrietta-street, London, W.C.2.

Now Ready. Pp. xi. + 269. With 3 Charts. 5s. net.
ON ALCOHOLISM: Its Clinical Aspects and Treatment.
By FRANCIS HARE, M.D., Medical Superintendent of the NORWOOD SANATORIUM, Beckenham.
"Marked by candour, common sense, and moderation ..... likely to become the standard text-book."—BRITISH MEDICAL JOURNAL.
London: J. & A. Churchill, 7, Great Marlborough-street.

OXFORD MEDICAL PUBLICATIONS.

JUST PUBLISHED.

MENDERS OF THE MAIMED.
THE ANATOMICAL AND PHYSIOLOGICAL PRINCIPLES UNDERLYING THE TREATMENT OF INJURIES TO MUSCLES, NERVES, BONES AND JOINTS.
By ARTHUR KEITH, M.D., F.R.C.S., LL.D., F.R.S
Conservator of the Museum and Hunterian Professor, Royal College of Surgeons, England.
Demy 8vo. Cloth. 336 pp. Illustrated. Price 16s. net.

THE NERVOUS CHILD.
By H. C. CAMERON, M.A., M.D. (Cantab.), F.R.C.P. (Lond.),
Physician to Guy's Hospital, and Physician-in-Charge of the Children's Department, Guy's Hospital.
Crown 8vo. Cloth. 210 pp. Price 6s. net.

Henry Frowde and Hodder & Stoughton, 17, Warwick-square, Newgate-street, London, E.C. 4.

NOW READY. SIXTEENTH EDITION. REPRINTED 1918. REVISED AND ENLARGED.
THE EXTRA PHARMACOPŒIA
By MARTINDALE & WESTCOTT.
PRICE 24s. net; postage 6d., abroad 8d. Separately, Vol. I., 16s. net; postage 5d. Vol. II., 8s. net; postage 3d.

"It is a book that is indispensable to the modern pharmacist, and in this case an old edition is not 'just as good.'"
—CHEMIST AND DRUGGIST.
"The two volumes together form an invaluable compendium of information."—BRITISH MEDICAL JOURNAL.
"A work of great utility."—THE LANCET.
"The Extra Pharmacopœia maintains its high standard and more. All interested will welcome this new edition of an indispensable book."—PHARMACEUTICAL JOURNAL.

LONDON: H. K. LEWIS & CO. LTD., 136 GOWER STREET, W.C. 1.
Publishing and Wholesale Office: 28 GOWER PLACE, W.C. 1.

LESLIES' ZŌPLA

(ZINC OXIDE PLASTER) Formerly Zincoplast.

THE PERFECTED SURGICAL PLASTER.

Instantly Self-adhesive. Will not slip wherever put. THE ONE REAL NON-IRRITATING PLASTER. Will keep without drying up.

Supplied on White and Flesh-colour Cloths, also on Holland on Spools ½" to 4" wide in 5 or 10 yard lengths in rolls 7" and 12" wide. Also on moleskin, chamois leather, felt, and waterproof cloth. **SAMPLES ON REQUEST.**

ZŌPLA is made by the firm with the reputation for BROWN HOLLAND STRAPPING (Original make).

LESLIES, Ltd. (British firm throughout), **62, London Wall, E.C. 2.**

GOLD MEDAL, INTERNATIONAL CONGRESS OF MEDICINE, LONDON, 1913

"MIST. PEPSINÆ CO. c. BISMUTHO"

(HEWLETT'S).

COMPOSITION.—Pepsin, Bismuth, Sol. Opii Purif., Hydrocyanic Acid (B.P.), Tinct. Nux Vomica, &c.

An elegant preparation, miscible with water, invaluable in Gastric Catarrh, Pyrosis, Carcinoma, and all Forms of Atonic and Irritative Dyspepsia.

DOSE: Half to One Fluid Drachm Diluted.

Packed, for dispensing only, in 10, 22, 40, and 90-oz. Bottles.

Physicians will please write "Mist. Pepsinæ Comp. (Hewlett's)."

INTRODUCED AND PREPARED ONLY BY

C. J. HEWLETT & SON, LTD., Wholesale & Export Druggists

35 to 42 CHARLOTTE STREET, LONDON, E.C.

VALENTINE'S
PREPARATION
NUTRIO PEPTIC
MEAT JUICE.
DIRECTIONS-Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

Valentine's Meat-Juice

For Quieting the Irritable Stomach Aiding Digestion and Sustaining and Strengthening, Valentine's Meat-Juice is employed in Hospital and Private Practice in the treatment of

Diseases of Children

Dr. Raphael Raimondi, *Consulting Physician of the Montmartre Nurseries, Paris, France:* "I use VALENTINE'S MEAT-JUICE with Nurslings eighteen months to two years old. These very Weak Babies derive great benefit from the use of this tonic preparation. I give it to Debilitated Infants, after they are eighteen months old, in doses of one teaspoonful in thirty grammes of boiled water twice a day, and to be continued for a month."

Park B. Tucker, M.D., *Health Officer, Hamilton, Bermuda:* "I have found VALENTINE'S MEAT-JUICE invaluable for teething children, who readily take and retain it when they refuse everything else. It has also proved very palatable and strengthening in all cases of irritable stomach, especially to that peculiar nausea so often complained of from the abuse of ardent spirits."

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,

D 117 RICHMOND, VIRGINIA, U.S.A.

THE LANCET.

No. 5002. LONDON, SATURDAY, JULY 12, 1919. Vol. CXCVII.

CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

THE GOULSTONIAN LECTURES on the Spread of Bacterial Infection. Delivered before the Royal College of Physicians of London. By W. W. C. TOPLEY, M.A., M.D. Cantab., F.R.C.P., Director of Institute of Pathology, Charing Cross Hospital.—Lecture II. (*continued*).—(*Illustrated*) 45

ORIGINAL ARTICLES

On Streptococcal Infections of Septic Wounds at a Base Hospital. By ALEXANDER FLEMING, F.R.C.S.Eng., Hunterian Professor, Royal College of Surgeons of England; and A. B. PORTEOUS, M.B., B.S. Lond., late Pathologists to No. 8 Stationary Hospital, B.E.F., France.—(*Illustrated*) 49

Note on Certain Organisms Isolated from Cases of Influenza. By H. J. B. FRY, M.D. Oxon., Captain, R.A.M.C. (T.) 51

The Results to be Expected from Antenatal Care. By HARDLEY HOLLAND, M.D.Lond., F.R.C.S. Eng.; Physician, City of London Maternity Hospital; Assistant Obstetric Physician, London Hospital 53

Pneumokoniosis in Man and Horse. By W. C. RIVERS, M.R.C.S., D.P.H., Tuberculosis Officer, Barnsley District, West Riding, Yorks. 55

Tuberculosis from a West Indian Standpoint. By JOSEPH GEOGHEGAN, M.B., F.R.C.S.E., Temp. Captain, R.A.M.C.; Surgical Specialist, Belfast District; late Government Medical Officer, Turks Islands 56

Influenza-Pneumonia: The Bacteriology of the Complications in Fatal Cases. By OLIVER HEATH, M.A., M.B., B.C. Cantab., Capt., R.A.M.C.(T.C.) From the Laboratory of the 5th Northern Hospital 58

CLINICAL NOTES:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A Case of Acute Septic Meningitis of Otitic Origin; Complete Recovery. By J. ARNOLD JONES, O.B.E., M.B., Ch.B. Manch., F.R.C.S., Edin.; late Temp. Major, R.A.M.C.; Aural and Laryngeal Surgeon to the British Forces in Macedonia; Surgeon to St. John's Hospital for Diseases of the Ear, Manchester, &c. 59

A Case of Peritonitis following a Non-penetrating Wound of the Abdominal Wall. By A. E. CHISHOLM, F.R.C.S. Edin.; late Captain, R.A.M.C. 59

A Case with Complete Cessation of Fits Resembling Epilepsy. By H. DE C. WOODCOCK, M.D., F.R.C.P. Edin., D.P.H., &c. 60

MEDICAL SOCIETIES.

ROYAL INSTITUTE OF PUBLIC HEALTH: London Conference. (*Concluded*) 60

ROYAL SOCIETY OF MEDICINE: SECTION FOR THE STUDY OF DISEASE IN CHILDREN: Exhibition of Cases and Specimens 63

SECTION OF OBSTETRICS AND GYNÆCOLOGY: Case of Obstruction to Labour due to Ventrofixation.—Demonstration 65

TUBERCULOSIS SOCIETY: Annual Meeting 65

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION 65

REVIEWS AND NOTICES OF BOOKS.

A Text-book of Physiology. By Martin Flack, C.B.E., M.B., B.Ch. Oxon; and Leonard Hill, M.B., F.R.S. 66

Medical Annual for 1919 66

Military Physical Orthopædics. Part I.: Gunshot Wounds of Nerves. By Arthur Stanley Herbert, M.D., B.S. Lond., Lieut.-Col. (Temp.), N.Z.M.C. 66

The Theory and Practice of Massage. By Beatrice M. Goodall-Copestake. Second edition 67

Manual of Lip reading. By Mary E. B. Stormonth 67

Animal Parasites and Human Disease. By Asa C. Chandler, M.S., Ph.D. 67

The Quarterly Journal of Medicine. Vol. XII. No. 47 68

NEW INVENTIONS.

A Modified Cathcart's Apparatus (Dr. L. A. Célestine, *M.C.*)—(*Illustrated*) 68

LEADING ARTICLES.

THE LIQUOR TRAFFIC AND THE PUBLIC HEALTH 69

THE EPIDEMIOLOGY OF PYOGENIC INFECTION 70

THE SENSE OF STABILITY AND BALANCE IN THE AIR 71

A MEMORANDUM ON MALARIA FOR GENERAL PRACTITIONERS 72

ANNOTATIONS.

American Hospital for Great Britain 72

Light Sense 73

The British Scientific Products Exhibition 74

The Medical and Dental Registers 74

Epidemic Encephalitis (Nona) .. 74

Sir Clifford Allbutt's Portrait .. 75

Rabid Ignorance 75

The Pathogenesis of Deficiency Disease 75

SPECIAL ARTICLES.

National Conference on Infant Welfare 76

American Medical Association: Annual Meeting 78

Control of Venereal Disease 80

Paris: A League against Cancer.—Medical War Benefit.—Stereoscopic Radioscopy 80

URBAN VITAL STATISTICS:

English and Welsh Towns 81

Scotch Towns 81

Irish Towns 81

OBITUARY.

Richard Dancer Purefoy, M.D., LL.D. (Hon. Causâ) Dub., Past President of the Royal College of Surgeons in Ireland; Past President of the Royal Academy of Medicine in Ireland; Past Master of the Rotunda Hospital 81

Alexander Scott, M.D. Glasg., Certifying Factory Surgeon, South-East Glasgow and Tollcross 81

Dr. E. G. Fearnsides 82

CORRESPONDENCE.

Portrait of Sir Clifford Allbutt (Dr. G. E. Haslip) 82

Detoxicated Vaccines (Dr. S. Roodhouse Gloyne) 82

Epidemic Perinephric Suppuration (Prof. William Thorburn) 83

The Maintenance of Cottage Hospitals (Mr. Chas. E. S. Flemming) 83

Fees for Service on Pension Boards (Dr. H. M. Meyrick-Jones) 83

Hutchinson's Teeth (Dr. David Walsh) 83

The Medical Directory (Messrs. J. and A. Churchill) 84

MEDICAL NEWS.

New Hospital for East Ham 60

The League of Mercy 65

Presentation to Dr. Michael Grabham 82

Royal College of Surgeons of England: Election of Fellows to the Council 84

Examining Board in England by the Royal Colleges of Physicians of London and Surgeons of England: Pass-list 84

University of Manchester: Pass-list 84

University of Durham: Faculty of Medicine: Degrees Conferred 84

Metropolitan Hospital Sunday Fund 84

L.C.C. Ambulance Service 84

West London Medico-Chirurgical Society 85

Hospital Sunday Fund at Bristol 85

London and Counties Medical Protection Society 85

Royal Devon and Exeter Hospital 85

Harrogate Medical Society 85

Devon Education Committee and Medical Certificates 85

London Dermatological Society 85

Society for Relief of Widows and Orphans of Medical Men 85

THE SERVICES.

R.A.M.C. Temporary Officers 85

Royal Naval Medical Service 85

Army Medical Service 85

Royal Army Medical Corps 85

Royal Air Force 86

Indian Medical Service 86

PARLIAMENTARY INTELLIGENCE.

House of Commons: Treatment of Tuberculous Pensioners.—Welsh Board of Health.—National Health Insurance Bill.—Criticism of the Bill.—Nurses' Registration Bill.—Syphilis Treatment.—Medical Demobilisation 86

NOTES, SHORT COMMENTS, &c.

The Baths of Old London. By SEPTIMUS SUNDERLAND, M.D. Brux.—Part I. (*To be continued*) 89

Colonial Health Reports 90

The Kensington War Hospital Supply Depôt 90

A Pyschological Study of the Prisoner of War 90

Books, &c., received 88

Appointments.—Vacancies 88

Births, Marriages, and Deaths ... 89

Acknowledgments of Communications received 89

JOHN BALE, SONS & DANIELSSON, LTD.

THE URETHROSCOPE IN THE DIAGNOSIS AND TREATMENT OF URETHRITIS. By Major N. P. L. LUMB, R.A.M.C. Demy 8vo. 13 Plates (10 coloured). 10s. 6d. net; postage 6d.

EUGENICS AND ENVIRONMENT. By Professor C. LLOYD MORGAN, LL.D., D.S., F.R.S. Crown 8vo. 82 pp. and cover. 2s. net; postage 2d.

RELIGION AND REALITIES. By Dr. HENRY MAUDSLEY. Crown 8vo. Cloth, lettered. 3s. 6d. net; postage 4d.

83, 85, 87, 89, & 91, GREAT TITCHFIELD STREET, OXFORD STREET, LONDON, W.1.

The Edinburgh Medical Series.

JUST PUBLISHED.

CEREBRO-SPINAL FEVER

THE ETIOLOGY, SYMPTOMATOLOGY, DIAGNOSIS, AND TREATMENT OF EPIDEMIC CEREBRO SPINAL MENINGITIS.

By **C. WORSTER-DROUGHT**, M.A., M.B., Captain (Temp.) R.A.M.C., Officer in Charge, Cerebro-Spinal Fever Ward, and Neurologist to the Royal Herbert Hospital, Woolwich; and **ALEX. MILLS KENNEDY**, M.D., Captain (late) R.A.M.C., late Officer in Charge, Cerebro Spinal Fever Laboratory, and Bacteriologist to the Royal Herbert Hospital, Woolwich.

Demy 8vo. Cloth. With 8 full-page Plates and 56 line Illustrations and Charts in the text.

Price 30s. net.

LANCET.—"There can be no hesitation in confidently recommending this work as both a scientific and practical storehouse of information on cerebro-spinal fever."

BRITISH MEDICAL JOURNAL.—"The excellent monograph on Cerebro-Spinal Fever, ... the outcome of patient and honest work ..... the important chapter on treatment is written out of the fullness of personal experience, and like the work as a whole will be of great value to all who have to deal with this disease."

Published by A. & C. BLACK, Ltd.,
4, 5, & 6, SOHO SQUARE, LONDON, W.1.

Vanity Fair Cartoons for Sale.—Doctors, Surgeons, Scientists from 1s. 6d. each. Any Cartoon published by Vanity Fair supplied. Lists free.—R. Weir & Co., High-road, Woodford, E. 18.

Price 1s. With Illustrations.

APPLICATION OF TRUSSES

to HERNIÆ. Clinical Lecture delivered at King's College Hospital. By the late JOHN WOOD, F.R.S., Senior Surgeon to King's College Hospital. Reprinted from "Medical Examiner."
London: Matthews Brothers, 10, New Oxford-street, W.C.

STAMMERING

W. J. KETLEY, "Tarrangower," Brondesbury, N.W.
(30 years colleague of late B. BEASLEY, Brampton Park, Huntingdon.)
Those interested in the subject should write for his book, which will be sent post free.

STAMMERING, LISPING, & CLEFT-PALATE SPEECH

By Mrs. BEHNKE.

Price 1s. 6d. net (postage 2d.), of Miss Behnke, 39, Earl's Court-square S.W. 5, who receives Stammerers for Treatment, and Singers and Speakers for Voice Training. REFERENCES to Medical Practitioners.
"The method is scientifically correct and perfectly effective."
—GUY'S HOSPITAL GAZETTE.
"Pre-eminent success in the education and treatment of stammering and other speech defects."—THE TIMES.

CLOTH CASES FOR BINDING

THE HALF-YEARLY VOLUMES OF

"THE LANCET"

Can be obtained through any Bookseller in town or country, or from THE LANCET Office.

Price 2s. 6d. each, by post 2s. 10d.

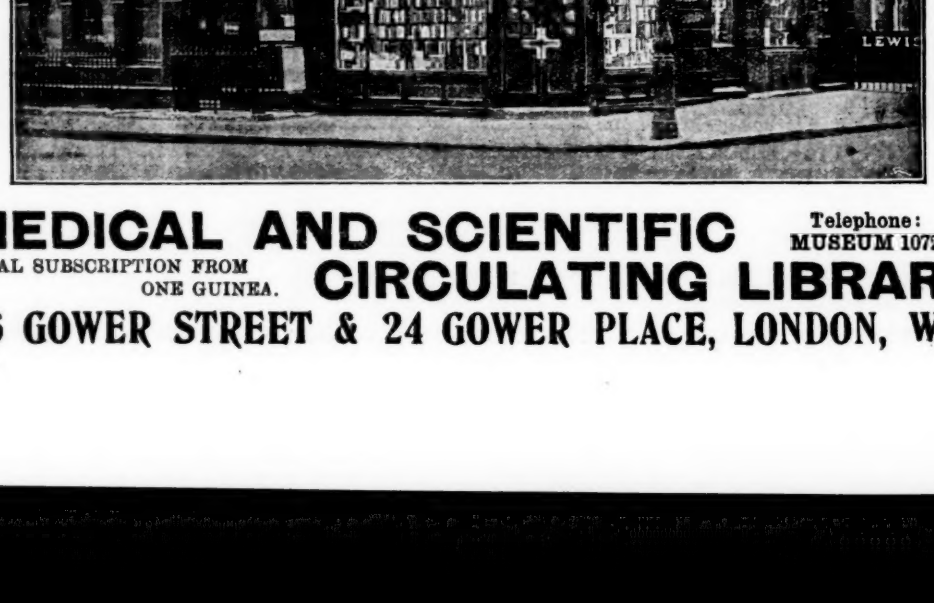
Office: 423, Strand, London, W.C. 2; and 1 & 2, Bedford-street, adjoining.

H. K. LEWIS & Co. LTD.,

MEDICAL PUBLISHERS AND BOOKSELLERS.

Complete Stock of Recent Books in Medicine, and General Science, Note Books, &c.

SCIENTIFIC BOOKS.



MEDICAL BOOKS.

MEDICAL AND SCIENTIFIC CIRCULATING LIBRARY.

Telephone: MUSEUM 1072.

ANNUAL SUBSCRIPTION FROM ONE GUINEA.

136 GOWER STREET & 24 GOWER PLACE, LONDON, W.C. 1.

The Goulstonian Lectures

ON

THE SPREAD OF BACTERIAL INFECTION.

Delivered before the Royal College of Physicians of London

BY W. W. C. TOPLEY, M.A., M.D. CANTAB., F.R.C.P.,

DIRECTOR OF INSTITUTE OF PATHOLOGY, CHARING CROSS HOSPITAL.

LECTURE II.

(Continued from p. 5.)

B. Danysz INFECTIONS IN RODENTS.

IN any attempt to obtain information on such points as these by experimental observation it is clearly necessary to work with some organism which is known to give rise to epidemic disease among the animals utilised. Such an organism is the bacillus isolated by Danysz, and the fact that the mouse is a susceptible animal is a distinct advantage in an inquiry of this type, where large numbers of animals must be employed.

Many observations have already been made on the effects produced by feeding cultures of this bacillus to small rodents, and some of the published reports contain data of considerable interest. This is especially true of the communication in which Danysz describes the original solation of the bacillus, the difficulties which he met with in attempting to increase its virulence to such an extent as to make it practically useful in exterminating rats and mice, and the effects produced by the strain which he finally obtained.

The strain originally isolated, when fed to grey rats, produced a mortality of 20–30 per cent, some others becoming ill but eventually recovering, while the remainder were apparently unaffected. Many attempts were made to increase the virulence by passage. Whether this was carried out by feeding or by subcutaneous injection the final result was always a decrease instead of an increase in virulence, when the successively isolated strains were administered with the food. Sometimes there was a slight increase in virulence up to the second or third passage, but then it steadily decreased, and the final result was always the survival of all the animals fed on one of the later strains. For this reason it was very rarely possible to go beyond 10 or 12 passages. Passage obtained by allowing the animals of one experiment to eat the dead animals from the preceding one, so as to avoid the intermediate growth in artificial culture medium, led to exactly the same results. Passage carried out in collodion sacs placed in the peritoneal cavity again ended in greatly reducing the virulence as estimated by feeding.

Explanation of Attenuation of Virulence.

Danysz suggests as an explanation of this attenuation of the organism that it has to face different conditions in the alimentary canal and in the blood and tissues, and that increased virulence for the latter produced by successive subcutaneous injections, or in similar ways, results in lessened virulence for the former. He mentions in support of this view the fact that bacilli isolated from the blood or the spleen at the period when they are beginning to pass from the intestine into the tissues are more virulent, when fed to other animals, than organisms isolated after death—that is, after they have multiplied in the tissues for some considerable time.

He points out, further, that these results indicate that in epidemics caused by this bacillus the cessation of the epidemic will be due to the attenuation of the organism, as well as to the natural resistance of the rodents. An experiment is quoted in support of this.

Two mice, which had become ill after being fed on a culture of *B. Danysz*, were placed in a cage with 30 normal mice. At the same time another 30 normal mice were divided into six batches, all of which were fed on the same culture. All of these latter died in from four to six days. The first death occurred in the large cage three days after the death of the two sick mice. The epidemic lasted 23 days, at the end of which time there were three survivors. These, however, died a month later after being fed on a similar culture.

Danysz considers that this proves that they were neither completely refractory nor completely immunised, and that their survival during the epidemic could only be explained by the attenuation of the organism. Though this explanation is quite probable, it should be noted that feeding with large quantities of culture is hardly a fair test, since size of dose is probably an all-important factor, and a degree of immunity which might well have served to preserve the three survivors from the dangers of infection in the cage might prove ineffective against such a massive dose of bacilli.

Production of Virulent Strains.

Danysz then describes the method by which he ultimately succeeded in producing a strain of his bacillus possessing a markedly increased virulence for rats, and reports the results of various practical tests with regard to the possibility of destroying these animals on a considerable scale. Sometimes the method proved entirely successful; at others it seemed to have little effect. He calls attention to the importance of repeated exposure of infected food in the rat-infested locality at 10–12 day intervals, in view of the attenuation by natural passage referred to above.

It will be observed that in the above summary of Danysz's paper the term "virulence" has been employed in describing the power of the bacillus to produce death or disease on being fed to rodents. This is the term which he actually employs, but it obviously covers several different attributes.

The reports of subsequent observers have been mainly confined to the efficacy of the different forms of virus placed on the market as a means for destroying rats and mice. Mühlens, Dahm and Fürst, Liston, and Bainbridge have all carried out investigations on this point. There is a very general agreement among these observers that the various strains of bacilli employed show wide variations in the mortality which they produce when fed to rats under many different conditions. The question of the spread of the infection to rodents not fed with the virus does not appear to have been especially studied.

EXPERIMENTS ON *B. Danysz*.

In the following experiments an attempt has been made to investigate the changes which may occur in the pathogenicity and other biological characteristics of *B. Danysz* as the result of repeated passage by feeding, and to arrive at some conclusion as regards the propagation of the infection from sick to normal mice.

The culture which formed the starting point of these experiments was kindly supplied to me by Dr. Arkwright, of the Lister Institute. It was originally obtained from the Pasteur Institute in Paris, and was the strain investigated by Bainbridge in 1908–09. The general technique adopted was as follows:—

Small pieces of bread were soaked with a 24-hour broth culture of the strain to be examined, and these were fed to a varying number of mice, which had not been fed for 12 hours previously and were not fed again until next day. In general only one feeding was carried out in any one experiment, but in a few cases the mice were fed on two or three occasions within the first four days.

When a mouse was found dead a post-mortem examination was made, and small portions of the spleen and liver were transferred to broth with due precautions as regards sterility. On the following day plate cultures were made from the broth tube on McConkey's medium. After 24 hours' incubation the plates were examined and likely colonies were subcultured into litmus-lactose-peptone-water. The full fermentation reactions were subsequently examined and the organism was tested against a powerful agglutinating serum. At the same time an agar-slope culture was prepared, sealed up with paraffin wax and placed in the ice-chest. When a given organism was fully identified as *B. Danysz*, and it was desired to investigate its action on mice, a tube of broth was inoculated from the agar culture and incubated for 24 hours. The culture so obtained was fed to a fresh series of mice in the manner indicated above. Certain deviations were made from this routine in particular cases, but these will be indicated where necessary.

When the broth tubes to which the portions of spleen and liver had been added appeared sterile after 24 hours' incubation, and the plates inoculated from them showed no growth, they were incubated for at least 24 hours longer and fresh plate cultures made before they were discarded. It hardly ever happened, however, that where the first plate cultures remained sterile a growth was subsequently obtained, and broth tubes which appeared sterile after 48 hours' incubation invariably remained so.

Some Difficulties Encountered.

It is well to consider at the outset certain difficulties which have been encountered, and which seem inherent in an investigation of this kind. It is by no means easy to decide in many cases whether or no a mouse has died as the result of a *B. Danysz* infection.

In the first place, it is not always possible to make a post-mortem examination. An appreciable proportion of the dead mice are found partially or almost entirely eaten by their companions.

In the second place, the post-mortem findings are neither so typical nor so constant that great reliance can be placed upon them. The spleen is usually enlarged, often very considerably so. In a minority of cases the spleen and liver show multiple minute yellow areas. There is often an apparent enlargement of the lymphatic glands throughout the body, but this would seem to be a common feature in mice which have died from a variety of causes. The condition of the intestines varies enormously. In almost all cases it is the small intestine which shows variations from the normal. The most common condition in my experience has been a marked distension of this portion of the bowel with a bright yellow fluid. In other cases the lower part of the small intestine is plum-coloured, sometimes nearly black and apparently gangrenous.

A large number of sections have been examined from the organs of the mice dying during the course of these experiments, and similar specimens from other mice have been studied as controls. It has not been possible, however, to make out any constant changes which could be regarded as diagnostic of an infection with *B. Danysz*.

Another disturbing factor is the fact that a considerable proportion of the mice were found to be harbouring intestinal parasites in the shape of cestode worms. Dr. Leiper has kindly given me the benefit of his great experience in this matter, and has examined some of the specimens obtained. He informs me that the degree of infection observed is not to be regarded as a heavy one, and gives it as his opinion that the only disturbing influence which the presence of these parasites might introduce into the general course of the experiments would be a certain degree of damage to the epithelium which might facilitate tissue invasion by the bacterial parasite.

Again, a mouse may die under circumstances which render it almost certain that it has succumbed to a *B. Danysz* infection, and pure cultures of this organism may be obtained from the spleen and liver, and yet the changes found post mortem may be practically negligible. Thus the bacteriological results seem to form our most certain criterion for diagnosis, but here, again, there are many difficulties to be faced. As pointed out above, a proportion of the dead mice are found partially eaten. In most cases the deaths were preceded by little or no evidence of illness, although there were exceptions to this. As a rule, one or more mice were found dead when the cages were examined in the morning. It would seem that post-mortem decomposition sets in very rapidly in these animals, and only a minority of the mice were in a condition which could be regarded as in any way ideal for bacteriological investigation. Although these facts must be borne in mind in drawing conclusions from the results obtained, yet the actual sequence of events, and the bacteriological results, leave little room for doubt as to the cause of death in the majority of cases. In most of the cases in which *B. Danysz* was isolated from the organs it was present in pure culture.

After a given batch of mice had been fed on a particular strain of the organism the animals were watched over a prolonged period, often several months. This was done partly to determine whether *B. Danysz* infections eventually develop in mice which show no evidence of illness during the earlier stages of the experiment, and partly in order that the survivors might be examined for any possible acquired immunity. In mice kept over such long periods it is inevitable that death should occur from causes other than infection with *B. Danysz*. Deaths which have occurred from ascertainable and extraneous causes have not been recorded. Thus mice which showed serious wounds as the result of fighting and died within a short time afterwards have not been included.

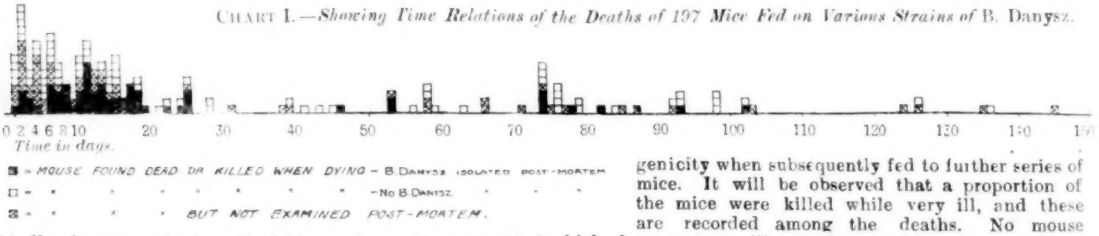
RESULTS OF EXPERIMENTS.

Chart I. records the deaths of 197 mice which succumbed after being fed in the manner indicated. The black and shaded squares represent those animals from which *B. Danysz* was isolated post mortem. It will be seen that the majority of the deaths occurred within 30 days of feeding, and that, while *B. Danysz* was isolated from a high proportion of the mice dying during this period, it was seldom recovered from those dying at a later date. For this reason the records of each experiment are only given in the charts for the 30 days subsequent to that on which feeding was carried out, though in those few cases in which a late outbreak of disease occurred the fact is indicated in the text.

It is not possible to give full details of the various feedings, deaths, and post-mortem findings, but Chart II. indicates sufficiently the course of events during a series of such experiments lasting over about five months. The number of mice fed in each case is noted, and the deaths are recorded so as to show the time at which they occurred and the bacteriological results obtained.

Each experiment after the first was carried out by feeding a batch of mice on a culture of *B. Danysz* isolated from the liver or spleen of a mouse from a preceding experiment, the object in view being to ascertain whether any strains would be evolved showing striking variations as regards their pathogenicity when subsequently fed to further series of mice. It will be observed that a proportion of the mice were killed while very ill, and these are recorded among the deaths. No mouse which became very ill was known to recover, and no error will be involved in this way. As pointed out above, most of the deaths have occurred in mice which showed no previous sign of illness, and definite symptoms have almost invariably been followed by death within 24 hours.

CHART I.—*Showing Time Relations of the Deaths of 197 Mice Fed on Various Strains of* B. Danysz.


0 2 4 6 8 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Time in days.
■ = MOUSE FOUND DEAD OR KILLED WHEN DYING – B. DANYSZ ISOLATED POST-MORTEM
□ = " " " " " " " – No B. DANYSZ " " "
⊠ = " " " BUT NOT EXAMINED POST-MORTEM.

Preliminary feedings with the original strain showed little evidence of pathogenicity for mice, though subsequent re-testing at a much later date has credited it with more definite results. For this reason the original passage was carried out by feeding a small number of mice on the usual broth cultures on two occasions with an interval of one day between them, and then killing one of them with chloroform 24 hours after the second feeding. Cultures of *B. Danysz* were obtained from the liver and spleen, and that from the spleen was used in the next experiment. The survivors from this preliminary feeding showed no ill-effects during the considerable period for which they were kept under observation.

Examination of the chart reveals the fact that the strain from this first mouse showed definite pathogenicity on being fed to the 12 mice of Experiment 2. Eight of the 12 animals died, or were killed when dying, within 25 days, and from five of these cultures of *B. Danysz* were obtained post mortem. On the other hand, the deaths were unevenly distributed over the 25 days, and showed no tendency to be accumulated within a small time interval.

Experiments 3, 3A, 3B, 3C, 3D, *and* 3E.

Experiments 3, 3A, and 3B were carried out by feeding 12 mice in each case with a culture obtained from the spleen of a mouse which had been found dead during the course of Experiment 2. As will be seen, the strains employed in Experiment 3 and 3B were almost without effect.

In Experiment 3A six mice died within the first 24 days, but the first three of these were found almost entirely eaten, and in only one of the remaining three was

CHART II.—*Experiments Showing Results of Feeding Successive Series of Mice on Cultures of B. Danysz Isolated from Mice Dying in Preceding Experiments.*

Deaths only Recorded for 30 Days after Feeding.

I. Fed on original strain of B. danysz.
II. Fed on strain from spleen of A. Exp. I.
III. Fed on strain from spleen of B. Exp. II.
IIIA. Fed on strain from spleen of C. Exp. II.
IIIB. Fed on strain from spleen of D. Exp. II.
IIIC. Fed on strain from spleen of E. Exp. II.
IIID. Fed on strain from liver of E. Exp. II.
IIIE. Fed on strain from spleen of F. Exp. II.
IVA. Fed on strain from spleen of G. Exp. IIID.
IVB. Fed on strain from liver of H. Exp. IIID.
VA. Fed on strain from spleen of J. Exp. IVA.
VB. Fed on strain from spleen of K. Exp. IVA.

CHART III.—*Experiments Showing Results of Feeding Successive Series of Mice on Cultures of B. Danysz Isolated from Mice Dying in Preceding Experiments.*

[Deaths only Recorded for 30 Days after Feeding.

IVX. Fed on strain from spleen of G. Exp. IIID.
VX. Fed on strain from whole spleen culture of L. Exp. IVX.
VIX. Fed on strain from whole spleen culture of M. Exp. VX.
VIX1. Fed on strain from strain "A" from spleen of M. Exp. VX.
VIX2. Fed on strain from strain "B" from spleen of M. Exp. VX.
VIX3. Fed on strain from strain "C" from spleen of M. Exp. VX.
VIX4. Fed on strain from strain "D" from spleen of M. Exp. VX.
VIX5. Fed on strain from strain "E" from spleen of M. Exp. VX.
VIX6. Fed on strain from strain "I" from spleen of M. Exp. VX.
VIX7. Fed on strain from strain III. from spleen of M. Exp. VX.
VIX8. Fed on strain from strain III. from spleen of M. Exp. VX.
VIIX. Fed on strain from spleen of N. Exp. VIX8.

Key to Charts II. and III.

Each square represents an individual mouse fed on strain indicated. A, B, C, &c. = origin of strains used in subsequent experiments.

= Mouse killed while apparently healthy 24 hours after feeding. *B. danysz* isolated P.M.

= Mouse survived more than 30 days.

= Mouse found dead. *B. danysz* isolated P.M.

= Mouse killed while very ill. *B. danysz* isolated P.M.

= Mouse found dead or killed while very ill. No *B. danysz* isolated P.M.

= Mouse found dead or killed while very ill. Not examined P.M.

On day indicated in left upper portion of square.

B. Danysz isolated post mortem. The deaths in this case were probably the result of the feeding, but the connexion is less definite than in Experiment 2, and the pathogenicity of the strain is less rather than greater. Thus in these three experiments, in which strains obtained from the spleens of mice found dead during the course of Experiment 2 were utilised, the effect of passage had been definitely to decrease the pathogenicity for mice when administered by the alimentary tract.

A strain of *B. Danysz* isolated from the spleen of a mouse of Experiment 2 which was found dying on the 25th day after the first feeding was fed to the 12 mice of Experiment 3 C. The results showed no evidence of an increase in pathogenicity.

The strain isolated from the liver of the same mouse, the culture from whose spleen was employed in Experiment 3 C, was fed to the 12 mice of Experiment 3 D. This experiment gave results which seemed to point to a definite variation in the pathogenicity of the bacillus. Nothing whatever occurred during the first nine days following that on which the mice were fed, but on the 10th day one mouse was found dead, two mice dying, and several others obviously ill. One of these succumbed on the 14th day, but the others recovered. This forms the only instance in which several mice, which were obviously ill, recovered from the infection. The liver and spleen from the mouse which was found dead proved sterile. The two dying mice were killed, and cultures from the livers of both and from the spleen of one yielded pure growths of *B. Danysz*. The second spleen culture remained sterile.

The marked difference between the strains isolated from the liver and spleen of the same mouse of Experiment 2, which is indicated in this and in the preceding experiment, is worthy of notice.

The strain isolated from the spleen of the second of the two mice of Experiment 2, which died on the 25th day after feeding, was fed to the 12 mice of Experiment 3 E. There was a considerable early mortality, five mice dying between the 4th and 7th day, but no bacteriological evidence was forthcoming that they had succumbed to a *B. Danysz* infection.

Experiments 4 A *and* 4 B.

By far the most definite evidence of pathogenicity had so far been afforded in Experiment 3 D. The culture obtained from the spleen of one of the mice found dying on the 10th day of this experiment was fed to the 12 mice of Experiment 4 A. The results were definite and striking. There was a period of 14 days during which nothing happened. Between the 15th and the 25th day, eight of the 12 mice died, or were killed in a dying condition. From the tissues of six of the eight mice *B. Danysz* was isolated post mortem. There could be no doubt here that a variant strain had been isolated showing a definite increase in pathogenicity.

A culture obtained from the liver of another mouse of Experiment 3 D, which was found dying on the same day as the mouse which yielded the strain used in Experiment 4 A, was fed to the 12 mice of Experiment 4 B. The result was in sharp contrast to that obtained in the previous experiment, for there appeared to be an almost entire absence of pathogenicity.

Experiments 5 A *and* 5 B.

In Experiments 5 A and 5 B strains were employed from the spleens of two mice found dying on the 17th day of Experiment 4 A. The results were curious and somewhat similar in the two cases. Both strains appeared to be almost devoid of immediate pathogenicity, but in each case a late outbreak of disease occurred. In Experiment 5 A three mice succumbed on the 53rd day, and the six survivors were all found dead on the 74th day. From five of these last nine mice *B. Danysz* was isolated post mortem.

In Experiment 5 B six mice died between the 56th and the 59th day; but since *B. Danysz* was in no case isolated, it is difficult to affirm that the deaths were due to infection with this organism, though the post-mortem appearances were entirely compatible with this being the case.

In what way these late deaths are related to the original feeding it is impossible to determine, but they can hardly be regarded in the same light as the deaths occurring within the first 30 days of the experiment.

Survey of Results: Further Experiments.

If we survey the results thus far obtained we see that as the result of passing the original strain of *B. Danysz* through a series of mice, the strain isolated from the tissues of one animal being fed to the animals of the next experiment, a strain has been evolved showing a definite increase in pathogenicity. In the next passage, however, this pathogenicity seems to have been lost or radically altered. It is clear, indeed, from the whole series of experiments that this loss readily occurs as the result of passage carried out in this way, and the original findings of Danysz are amply confirmed. That a definite increase in pathogenicity may also result has, however, been established. Another fact is quite definitely shown. Strains obtained from mice killed when very ill are much more likely to be pathogenic than strains from mice which have been found dead. Here, again, the results are in accord with those reported by Danysz.

In order to see whether a further increase in pathogenicity could be obtained, a fresh series was started, commencing with the strain isolated in Experiment 3 D, which had been fed to the mice of Experiment 4 A. The results are indicated in Chart III. The four mice of Experiment 4 X were fed with this strain. All four succumbed on the 13th day of the experiment. One was found dead and partially eaten, the other three were dying. From each of these three *B. Danysz* was isolated post mortem.

Certain of the previous experiments had indicated that bacilli of varying pathogenicity might be isolated from the tissues of a single mouse. For this reason the broth culture from the spleen of one of the mice from Experiment 4 X was fed to the mice of the next experiment without previous plating. A subculture made from it immediately beforehand gave a pure culture of *B. Danysz*. The spleen tissue itself was not fed to the mice.

The result of this experiment (5 X) was striking. Twelve mice were fed. Two died on the 4th day, one on the 5th, and the remaining nine succumbed on the 11th day. From six of these nine mice *B. Danysz* was isolated.

In order to examine further the possible differences of strains of the bacillus isolated from the spleen of a single mouse the following procedure was now adopted.

A portion of the spleen from one of the mice which was found dying on the 11th day of the above experiment was rubbed over the surface of a plate of McConkey's medium, and then dropped into a tube of broth, which was incubated for 24 hours. At the end of this time a second McConkey plate was inoculated. From the scanty growth which developed on the first plate eight colonies were subcultured into broth and the tubes labelled A–H. From the second plate six colonies were picked off and the corresponding broth tubes numbered 1–6. All cultures were identified as *B. Danysz* by fermentation and agglutination tests.

Into each of seven cages were placed six mice. The first batch were fed on the broth culture obtained from the whole spleen (Exp. 6 X). The next five batches were fed on cultures A–E obtained from colonies which developed on the plate inoculated directly with spleen tissue (Exps. 6 X 1–6 X 5). The last two batches were fed on strains 1 and 3 obtained from colonies which developed on the plate inoculated from the original broth tube (Exps. 6 X 6 and 6 X 7).

The chart shows the results. All the strains, with the possible exception of strain 1, showed definite pathogenicity. The broth culture obtained directly from the spleen tissue was no more pathogenic than the rest. Strain 3 stands out prominently, all the six mice of this experiment succumbing within three days. As *B. Danysz* was only isolated from one of the six mice, a second batch of the same number were fed on a broth culture obtained from the agar slope of this strain which had been placed in the ice-chest.

The result (Exp. 6 X 8) entirely confirmed the high pathogenicity of the strain, all six mice were found dead on the 6th day, and from four of them *B. Danysz* was isolated post mortem.

From the strain isolated from the spleen of one of these mice six other mice were fed (Exp. 7 X). The loss of pathogenicity is obvious, and we see again the tendency for successive passages to lead to the final loss by the parasite of the power of producing disease when administered with the food.

Experiments to Test Results of Prolonged Cultivation.

To exclude the possibility of the results noted being due to some extraneous factor rather than to variations in the biological properties of the bacillus, and to determine what

alteration, if any, would result from prolonged cultivation on artificial media, the strains which showed the widest variations were retested at subsequent dates. As mentioned above, the various strains isolated were grown on agar slopes, sealed with paraffin wax, and placed in the ice-chest. They were subsequently subcultured on to further agar slopes at intervals of six weeks, the fresh cultures, after 24 hours in the incubator, being preserved in the same way.

The original strain was tested on five batches of mice between July, 1918, and February, 1919. On the first occasion no mouse succumbed within 30 days. In the later experiments a few mice died in each case. The highest mortality occurred in the last test carried out, when four of eight mice died during the 30 days over which the experiment continued. From only one of these mice, however, was *B. Danysz* isolated. Moreover, the deaths, when they occurred, were irregularly distributed in time. On no occasion were more than one mouse found dead on any one day.

The strain from the spleen of the mouse of Experiment 3 D which was used in Experiment 4 A was retested on four subsequent occasions between September, 1918, and February, 1919. In the first experiment 8 of 12 mice died within 30 days, a mortality of 66 per cent. In the second experiment the mortality during the same period was 100 per cent. In the three subsequent tests the mortality was 66, 66, and 62 per cent. respectively. Moreover, there was a most definite time distribution. In each of the three earlier experiments there was an incubation period of 12 to 15 days, followed by an outbreak involving the death of a large proportion of the mice within a few days. The difference between the results of these experiments and those carried out with the original strain were most striking when actually observed. On the last two occasions on which this strain was tested the tendency to produce a series of deaths within a short time interval and following a definite incubation period seemed to have been lost.

Similarly, the strain labelled "Spleen 3 : 5 x : 9.12," which was employed in Experiment 6 x 7, was retested on three occasions within the following two months. It showed on the first three occasions a consistent tendency to produce a high and early mortality. Thus all the mice of the first experiment died within three days. All the mice of the second experiment succumbed on the 6th day. Four of six mice fed in the third experiment died on the 3rd day, while a fifth died on the 16th. On the last retesting this strain seemed to have lost its peculiar properties.

Two other strains which had shown particularly low pathogenicity were subsequently retested, and the results confirmed those originally obtained.

Thus two strains at least were evolved which possessed quite definite infective properties. One tended to produce an outbreak of disease after an incubation period of 12 to 15 days. The other led to the death of all the animals fed within a few days. These properties were maintained for weeks or months under artificial cultivation, but were gradually lost, and when finally tested the strains were indistinguishable from the original strain of *B. Danysz*.

No attempt was made to maintain the pathogenicity of the cultures by special methods of cultivation and storage. The exact combination of properties on which this pathogenicity depended was a subject for surmise, but it was clearly not simply a question of virulence in the strict conventional sense. It seemed better, therefore, to rely on the simplest methods of culture and observe any changes which occurred.

The results of observations on the factors possibly concerned in the loss of pathogenicity by passage, and especially on the question of the spread of the infection from the mice fed on cultures of the bacillus to their normal companions, will be considered in my last lecture.

Bibliography.—**Bainbridge**: Journ. Path. and Bact., 1909, xiii., 443. **Billet, le Bihan and others**: Arch. de Méd. et de Pharm. Milit., 1910, lv., 259. **Brownlee**: Trans. Roy. Soc. Med. (Epidem. Soc.), 1909, ii., 243. **Bruns and Höhn**: Klin. Jahrb., 1908, xviii., 285. **Butler**: Proc. Roy. Soc. Med. (Epidem. Sec.), 1909, ii., 59. **Chesney**: Journ. Exp. Med., 1916, xxiv., 387. **Danysz**: Ann. de l'Inst. Pasteur, 1900, xiv., 193. **Flack**: Med. Res. Comm. Spec. Rept., Ser. No. 3, 1917. **Glover**: Journ. Hyg., 1918, xvii., 350, 367. **Graham-Smith**: The Bacteriology of Diphtheria, Camb., 1908. **Hutchens**: Med. Res. Comm. Rept., 1916. **Johnston**: Med. Res. Comm. Rept., 1916. **Köber**: Zeitschr. f. Hyg., 1899, xxxi., 433. **Ledingham and Arkwright**: The Carrier Problem in Infectious Diseases, Lond., 1912. **Ledingham and Penfold**: Journ. of Hyg., 1914, xiv., 242. **Liston**: Rep. Bombay Bact. Lab., 1907. **Mühlens, Dahm, and Fürst**: Centralb. f. Bakter. ü Parasitenk, 1909, Orig., xlviii., 1. **Penfold**: Journ. Hyg., 1914, xiv., 215. **Stillman**: Journ. Exp. Med., 1917, xxvi., 513. **Wadsworth and Kirkbride**: Journ. Exp. Med., 1918, xxviii., 791.

ON

STREPTOCOCCAL INFECTIONS OF SEPTIC WOUNDS AT A BASE HOSPITAL.

BY ALEXANDER FLEMING, F.R.C.S. ENG.,
HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND;
AND
A. B. PORTEOUS, M.B., B.S. LOND.,
LATE PATHOLOGISTS TO NO. 8 STATIONARY HOSPITAL, B.E.F., FRANCE.

IN connexion with streptococcus infections of wounds at base hospitals there are certain questions which are of fundamental importance.

What are the Types of Streptococci that Require to be Seriously Considered in Wound Infections?

There is one type of streptococcus which is predominant in septic wounds at the base. This type is responsible for almost all the severe septic complications of these wounds. It is to be found in pure culture in nearly all the infected joint cavities and fresh pockets of the wounds, and in our experience it has been responsible for all the streptococcal septicæmia following septic wounds.

Characters of this streptococcus.—It grows in broth in long chains of regular cocci. Some strains after 24 hours show very marked involution forms, the cocci being all shapes and sizes. The culture in broth consists of small woolly masses, which settle to the bottom of the tube (or along the side of the tube if it is incubated in a slanting position), leaving the upper portion of the medium clear. On agar (Douglas's trypsin agar) it grows well in moderate-sized colonies, which show by transmitted light a definite dark central portion, while the edges are slightly wavy and irregular. It does not liquefy gelatin. This streptococcus always grows better anaerobically, and not infrequently when first isolated it will not grow aerobically. After being cultivated for a short time, however, it grows freely under aerobic conditions. It is not constant in its sugar reactions. In the great majority of cases it ferments glucose, lactose, saccharose, and salicin, but not raffinose, mannite, or inulin. A few strains, however (about 12 per cent.), ferment mannite. These mannite-fermenting strains are identical morphologically with the non-mannite fermenters, and it has been shown by Douglas, Colebrook, and Fleming, in a report to the Medical Research Committee not yet published, by means of agglutination and absorption tests that serologically they are also identical.

Clotting of milk.—This test is very inconstant, and we have found that as regards the clotting of milk with these streptococci very much depends on the size of the tube in which the test is carried out. If the tube is of large size then the clotting is always delayed and it may even not take place in ten days, whereas in a small test-tube there is definite clotting in 24 hours. In a series of tubes of different sizes containing milk which had been heavily implanted with *Streptococcus pyogenes* and incubated for five days it was observed that no clotting had occurred in the two largest tubes, in the third tube clotting had occurred but there was no contraction of the clot, while in the smallest tube there was firm clotting with much contraction of the clot. This clotting of the milk in the smallest tube had occurred in the first 24 hours. Even in small tubes, however, the clotting of milk by *Streptococcus pyogenes* is quite inconstant and is worthless as a test.

Hæmolytic power.—All the strains of this streptococcus showed some hæmolytic power, but there seemed to be enormous differences in the amount of hæmolysin produced under the same conditions by streptococci which were isolated from the blood of septicæmic patients. In a number of cases the hæmolytic power was tested by centrifuging a broth culture and incubating for two hours at 37° C. dilutions of the clear supernatant fluid with washed human red corpuscles. In most cases, however, the question of whether these streptococci were hæmolytic or not was tested by noting the appearance produced by their growth on a blood agar plate (see Fig. 2).

Incidence of this streptococcus.—In a series of over 100 septic wounds (fractured femurs) which had remained at a base hospital for over seven days this streptococcus was present in almost every one. In cases of a similar nature where streptococci were recovered from the blood (47 cases) the organism was invariably of this type

Is the "Hæmolytic" Character of the Streptococcus of Fundamental Importance—i.e., Can Non-hæmolytic Streptococci be Ignored for Practical Purposes in Wounds?

As has been stated above, the only streptococcus which we have found to give rise to serious complications in a wound is the "pyogenes" type, which belongs to the hæmolytic group of streptococci, and we were forced to consider the non-hæmolytic streptococci to be of only secondary importance. In the more recent wounds, and especially in the wounds in which gas gangrene had developed, there is to be found very frequently streptococci of the "fæcalis" type. These are not present with anything like the same frequency in the latter cases. One of us (A. F.) in conjunction with Douglas and Colebrook[1] showed that streptococci (and other organisms) had a powerful effect in increasing the growth of anaerobic bacilli when grown with them in symbiosis. It may be that these streptococci of the "fæcalis" type have some importance in the wound on account of this symbiotic action, but alone they do not seem to be of any importance in wounds at the base.

What is the Source of the Streptococci Found in Wounds?

Examinations at a C.C.S. on recently inflicted wounds have shown that in only about 15 per cent. of cases is *Streptococcus pyogenes* present. Examinations at the base in cases which have been in more than a week reveal the presence of this organism in over 90 per cent. of the wounds.

During the summer of 1918 we examined a number of the gauze packs removed from wounds on arrival at the base. When the patient had been kept at the C.C.S. for more than three or four days *Streptococcus pyogenes* was present in almost every case. These cases correspond, therefore, closely with the patients who have been in base hospitals for more than a few days. Where, however, the patient had been sent straight on to the base after excision of the wound we found that *Streptococcus pyogenes* was present only in 15 out of 75 cases. Although in the majority of the packs from these recent cases we failed to find *Streptococcus pyogenes*, we were able to recover other microbes in every case from those portions of the packs which came from the depths of the wound, and often these microbes were present in very large numbers. The microbes isolated in these cases were chiefly anaerobic and aerobic bacilli and staphylococci.

Plate culture of 1 c.cm. of blood from a septicæmic patient taken immediately after being disturbed by being washed. Note the large number of streptococcus colonies and the zone of hæmolysis around each.

It has been conclusively demonstrated that *Streptococcus pyogenes* will grow much better than these other microbes in the blood fluids[2] such as would be found in a recently excised wound, so that had the streptococcus been present as a primary infection it should have been demonstrable on arrival at the base. It is to be noted, therefore, that on arrival at the C.C.S. 15 per cent. of the men were infected with *Streptococcus pyogenes;* on arrival at the base (when the cases had been sent straight on after operation) 20 per cent. were infected, but after a stay at the base of a week over 90 per cent. were found to have *Streptococcus pyogenes* in their wounds. It would seem a warrantable deduction from these observations that the streptococcal infection of wounds is in most cases a hospital infection, and it is probable that in the dressing of the wound the infection is carried from one patient to another.

It has long been known that *B. pyocyaneus* is spread from one patient to another in a ward by faulty technique in dressing, as this infection is manifest to the naked eye by the characteristic colour of the discharges. Other organisms which spread around a ward in the same way are *B. proteus* and diphtheroid bacilli. Now, as the *Streptococcus pyogenes* will grow in the discharges very much more readily than will these other organisms, it would be a miracle if it were not spread in the same way. It is unfortunate that infection by streptococcus does not produce any characteristic change in the smell or colour of the discharges, as it does not obtrude itself on the notice of the surgeon until some serious complication arises.

Have any Points Bearing on the Methods of Recovery from Streptococcus Infections Come to Light, and, if so, Can these be Exploited in Treatment?

In cases of septicæmia following serious wounds the proportion of recoveries is very small. Out of a series of 40 cases of septicæmia following compound fracture of the femur we have seen only four recoveries. The reason for these recoveries is not very evident. All the patients who recovered were treated with streptococcus vaccine, but it was very difficult to demonstrate in any of these septicæmia cases any direct benefit from the vaccine.[3]

In some cases of pyæmia, however, and in many less severe cases, the administration of streptococcus vaccine in doses of 1,000,000 to 5,000,000 was repeatedly followed by a drop in the temperature and a feeling of well-being to the patient. It has often been demonstrated that, following the injection of streptococcus vaccine, there is a rise in the amount of antibodies in the blood. In cases of severe injury, such as a fractured femur, there are very often portions of the wound which are inefficiently drained and to which the blood fluids do not have access, and this militates against any very dramatic effect following the administration of vaccine in such cases. We hold a very strong opinion, however, that in all septic wounds where the surgeon secures good drainage no harm would be done and much good would result from a routine administration of stock streptococcus vaccine in doses of from 1,000,000 to 5,000,000 once a week. It is not practicable to make autogenous vaccines in every case, and it has been demonstrated by Douglas, Colebrook, and Fleming that when an animal is injected with one strain of *Streptococcus pyogenes* it develops antibodies (agglutinins) to the same degree to all strains. It would appear, therefore, that a stock vaccine would be as useful as an autogenous one.

In cases of septicæmia it seems much more likely that streptococci are being continually thrown into the blood stream from some septic focus than that they should actually be growing and multiplying in the blood stream. If they did flourish in the circulating blood, then they should be present in much larger number than they are. If 1 c.cm. of blood is taken from a septicæmic patient, mixed with liquid agar at 47° C., and plated, it is uncommon to get more than 100 colonies. Usually only two or three develop.

This method has been found to be the best for blood culture in such cases. In quite a large series of blood cultures it has never failed to reveal streptococci when they were found in fluid cultures, and in two cases streptococci were found when they failed to develop from blood added to

[1] THE LANCET, 1917, i., 604.

[2] Wright: Proceedings of the Royal Society of Medicine, 1915.

[3] It should be remembered, however, that in a large series of puerperal septicæmia cases in which streptococci were demonstrated in the blood Western (THE LANCET, 1912, i., 351) by the use of vaccines obtained a very high percentage of recoveries (45 as against about 10 in a control series not treated by vaccines). These puerperal septicæmias do not seem to be very different from septicæmia following a septic wound.

broth or glucose broth. It has also the great merit that the number of streptococci in the circulating blood can be determined. The technique is as follows:—

1 c.cm. of blood from the suspected septicæmic case is added to about 5 c.cm. of water. The blood will thus be laked and the clotting power diminished, so that it can readily be carried back to the laboratory before coagulation takes place. It is then mixed with about 20 c.cm. of agar at 47° C., poured into a Petri dish, allowed to set, and incubated. In 24 hours the colonies can easily be seen.

Minced meat medium, such as is commonly used in the cultivation of anaerobes, furnishes a better fluid medium for blood culture in these surgical cases than does broth, glucose broth, or citrated broth. In several cases we have obtained growths of streptococcus from the blood in this medium when they failed to develop in the broth cultures. It has the advantage that anaerobes, if present, will also develop.

The figure represents a plate made from 1 c.cm. of blood from a patient with septicæmia following a flesh wound in the thigh. It shows very many more streptococci than are usually present in the blood. Two days after the specimen was taken the patient died, and the autopsy showed, in addition to a septic thigh wound, abscesses in the hand, wrist, both elbows, neck, and a very large abscess in the buttock. The specimen of blood was taken immediately the orderlies had finished washing the patient, during which process he must of necessity have been considerably disturbed, and it seems probable that the large number of streptococci in the blood was due rather to this disturbance than to their growth in the blood stream.

It is unlikely, also, that the small number of streptococci present in the blood stream in the ordinary case of septicæmia would be able to flourish in that situation, as the serum of these patients show by Sir Almroth Wright's sero-culture method a very much enhanced bactericidal power to *Streptococcus pyogenes*.[4] (The bactericidal power of normal serum to this microbe is practically nil.)

So far as we know, streptococci are destroyed in the body by three agencies: (1) bactericidal power of the serum; (2) direct bactericidal power of the leucocytes (without phagocytosis); (3) phagocytosis due to the combined action of the serum (opsonic power) and leucocytes. In streptococcal septicæmia these are changed from the normal as follows.

1. *Bactericidal power of the serum.* (This, as stated above, is increased.)

2. *Direct bactericidal power of the leucocytes.*—It has been shown[5] that living leucocytes have the power of destroying streptococci without ingesting them. This power of the leucocytes is apparently unaltered in septicæmia cases except that as there is always a leucocytosis in these cases the power is more manifest.

3. *Phagocytosis.*—In some cases of septicæmia the serum has lost completely or almost completely its opsonic power (and also its complementing power). The phagocytic power of the leucocytes is not diminished.

It would appear from these observations that, as a rule, it is not the circulating blood which is at fault in cases of streptococcal septicæmia, and in all probability we have to look for some deficiency in the local protective mechanism which allows access of the streptococci to the blood stream. It would seem to follow, also, that for the successful treatment of a case of septicæmia the most essential element would be the thorough local treatment of the infected focus.

It has been observed that when an infection has become circumscribed by the collection of leucocytes in the walls of the wound and by the other factors which operate locally in this connexion, it is very difficult to graft a serious streptococcal infection on the wound. It follows from this that the utmost care should be taken in the first few days after the injury to keep out the streptococcus and to avoid any treatment which will inhibit the defensive processes developing. In the after-treatment fresh tissue should only be opened up when there is a very urgent necessity.

In conclusion, we wish to express our thanks to Major M. Sinclair and our other surgical colleagues for permitting us to make observations on patients under their care; to Captain L. Colebrook for permission to use some of his experimental work; and to the Medical Research Committee for supplying us with apparatus which made the work easier.

[4] For this observation we are indebted to Captain L. Colebrook.
[5] Wright, Fleming, and Colebrook, THE LANCET, 1918, i., 831.

NOTE ON

CERTAIN ORGANISMS ISOLATED FROM CASES OF INFLUENZA.

BY H. J. B. FRY, M.D. OXON.,
CAPTAIN, R.A.M.C. (T.).

IN the course of investigation of material derived from cases of influenza during the three waves of the present epidemic, when searching for Pfeiffer's bacillus, Gram-negative, "Pfeiffer-like" bacilli were frequently isolated. They were not, however, hæmophilic, and grew rapidly and readily on ordinary agar. They have been isolated from sputum, post-mortem material, and in blood culture. The organisms derived from the latter source deserve further description.

They were isolated from the blood of two German prisoners, out of four cases examined, at the commencement of the third wave of the epidemic in February, 1919. The camp to which the prisoners had belonged had escaped the two previous waves, but was overwhelmed by the present one, a large proportion of the prisoners being severely attacked.

The organism was obtained in 2 per cent. glucose broth, and appeared in 24 hours in the blood culture, as round or oval Gram-negative "yeast-like" bodies, 3–5μ long by 2–4μ broad. Subculture to agar produced, not the above organisms but Gram-negative bacilli, varying in size from coccal or cocco-bacillary forms to short filaments. The "yeast-like" bodies rapidly disappeared from the blood culture, and were replaced by clumps of Gram-negative bacilli, in the neighbourhood of which could be seen, in some cases, Gram-negative amorphous masses, resembling the ruptured envelopes of the above-mentioned "yeast-like" bodies.

Characters of Organism: Pathogenesis.

The bacilli were pure in subculture, and had the following morphological and cultural characters:—

Morphology and cultural characters.—Small non-sporing bacilli, often grouped in parallel, or as diplo-bacilli, 1–2μ in length, but varying in size from coccal forms to short filaments. The smaller forms are actively, but the larger forms are feebly, motile. They are Gram-negative but not acid-fast. Polar staining is not usually present. They are aerobic and grow rapidly and well on agar, forming a whitish-grey moist growth of circular, slightly flattened colonies, about 0·5 mm. in diameter. Viewed by transmitted light, the colonies are translucent and slightly iridescent. In stab-culture on gelatin there is a white growth, confined to the needle track, without extension on the surface, and the gelatin is not liquefied. Broth is rendered turbid, with a flocculent, whitish, stringy deposit.

The fermentation reactions are as follows: Acid production but no gas in dextrose, maltose, and mannite. No change in lactose, cane-sugar, salicin, or inulin. Litmus milk is first rendered faintly acid and then becomes strongly alkaline, without any clotting. Neutral-red broth is rendered alkaline. There is a fairly well-marked indol reaction after 48 hours' growth in peptone water. Stalactite growth was not obtained in butter-fat broth.

Grown on 6 per cent. salt agar, numerous yeast-like forms were obtained resembling those obtained in the blood culture, together with filamentous, curved, and swollen forms. The organism resists heating to 65° C. for 30 minutes, but is killed at a temperature of 60° C. for 1 hour.

Pathogenesis.—The organism was highly pathogenic to the rat and guinea-pig. 0·25 c.cm. of a saline emulsion of a 24-hour agar culture by intrathoracic injection killed a white rat in 17 hours. The lesions produced were ecchymoses and hæmorrhagic extravasations on the surfaces of both lungs, which were congested and œdematous. The heart was engorged and filled with clot. The organism was recovered in pure culture from heart, lungs, and spleen.

A similar dose by intrathoracic injection killed a guinea-pig in five days, causing a slight caseous nodule at the site of inoculation, sero-purulent effusions into both pleural sacs, and lobular pneumonia with hæmorrhages in both lungs. The bronchial glands were greatly enlarged and showed caseous nodules. The heart was dilated and filled with clot. The organism was recovered in pure culture from the pleural effusion, lungs, heart blood, tracheal mucus, and spleen. By intraperitoneal inoculation death was caused

in four days, with sero-fibrinous peritonitis and hæmorrhagic infarcted areas in the lungs.

The organism appears, therefore, to be related to the hæmorrhagic septicæmic group of bacilli, and in its cultural and fermentation reactions is somewhat similar to *B. pseudo-tuberculosis*. According to MacConkey,[1] the fermentation reactions of *B. pseudo-tuberculosis* and of *B. pestis* are practically identical. This is of interest in view of the general resemblance which exists between the pathological changes in the lungs in acute influenza and pneumonic plague. Moreover, forms resembling *B. pestis* were obtained in culture from the rat. Similar forms have been noted by Donaldson[2] in the sputum, and in the lung juice by Harris.[3]

One of the patients from whom this organism was isolated died, but the other recovered. The serum obtained from the blood of the latter in the third week after onset of the disease failed to agglutinate the bacillus recovered from his blood. Complement-deviation tests with the patient's serum and the organism as antigen appear to be positive, but require futher investigation.

Addendum.—Since writing the foregoing statement a careful complement-deviation test with full technique, using Harrison's method, has been kindly carried out for me by Captain Lundie, R.A.M.C. An antigen prepared from the Gram-negative bacilli, together with the serum of the above-mentioned patient, gave complete deviation of complement in the following dilutions:—

—	Complement: M.H.D. units.			
	1½	2½	3	5
Antigen control...	...	...	–	...
Patient's serum...	++	++	+	–

+ No hæmolysis. – Complete hæmolysis.

In view of the importance of the above observation, it was repeated with controls both for the serum and the antigen. The result was as follows:—

—		Complement: M.H.D. units.		
		1	2	3
Controls	Antigen	–	–	–
	Patient's serum	+	Tr.	–
Test—Patient's serum...		+	+	+

Tr. Almost complete hæmolysis.

These observations therefore confirm the fact that in this case of "influenza" antibodies were developed in the patient's serum in response to the infection by the Gram-negative bacilli isolated from his blood.

It is of interest and some importance that experiments on the above lines with sera from cases of "influenza" obtained during the two preceding waves of the disease also show distinct deviation of complement with the above antigen. The results of these experiments will be published shortly. It would be valuable to carry out further observations with sera derived from recent cases of "influenza," if such are obtainable, since the above sera were naturally not fresh.

The organism, however, appears to bear some relation to "influenza" not only in its manifestation in the third wave of the epidemic, during which the organism was isolated, but to the two preceding waves. The presence of antibodies in the sera suggests the possibility of the preparation of an antiserum.

What relation, if any, this organism may bear to the filter-passing virus described by Bradford, Bashford, and Wilson[4] and other observers cannot here be considered, but an analogy may be noted in the epizootic pneumo-pleurisy of horses, with which the Gram-negative Pfeiffer-like *B. bipolaris equisepticus* is associated. In this disease horses have been infected with inflammatory mucus at a stage of its micro-scopical sterility.[5] *B. bipolaris equisepticus* belongs to the group of "pasteurella," to which also the organism above described may belong.

Another Organism.

In addition to the above Gram-negative bacillus another organism has been found in material derived from widely different sources in cases of influenza. This organism has the following characters:—

Morphology.—Round or oval spores, 4–5μ in diameter, staining deeply with Gram in young cultures, but showing Gram-negative forms in older cultures. It is aerobic and grows well at 37° C. on ordinary media, especially those containing glucose. On serum-glucose-agar it forms thick, white, confluent growths. Individual colonies on agar are white, moist, circular and opaque, 1 mm. in diameter or upwards. In gelatin stab-cultures growth is confined to needle track, and there is no liquefaction of the medium. On media containing glucose there is produced a sweetish odour of fermentation. Dextrose and maltose are fermented, but not lactose, cane-sugar, mannite, salicin, or inulin. In milk there is no change, nor in neutral-red broth. The organism is not pathogenic to the rat by intraperitoneal or intrathoracic injection.

This organism has been found in cases of influenza in the sputum, urine, and even in the fæces of influenza patients affected with hæmorrhagic diarrhœa, and has been isolated from the sputum and from the lungs post mortem. The interest which attaches to this organism lies, however, in the forms which are derived from it in culture.

Grown in a sterile hanging-drop of glucose-broth, or in culture on serum-glucose-agar, a remarkable variety of organisms is produced. Not only are large hyphal threads obtained, varying in their reaction to Gram staining, even in the same thread, and containing Gram-positive spore-like bodies, but from the large spores or the hyphæ are derived by budding coccal forms. These are seen as clumps of cocci, or as oval or lanceolate diplococci, or in chains as diplo-streptococci or streptococci composed of elements with flattened opposed sides. These coccal forms vary greatly in the reaction to Gram staining, even in young cultures, so that in diplococci one element may be Gram-positive and the other Gram-negative, and similarly in the streptococcal chains.

Certain forms intermediate between the finer hyphal threads and the coccal chains are seen as pleomorphic bacilli in rosettes or clumps breaking down into coccal elements.

Mention may here be made that various forms resembling the above have been obtained in blood cultures from cases of influenza and in sterile catheter specimens of urine. In sputum, the large spores or their derivatives can be seen in cases of influenza, and their presence may be of value in diagnosis.

The organism thus derived from the large spore shows considerable resemblances to the "Organism D" described by Donaldson.[2] The streptococcal forms isolated by plating the growth obtained from the large spores in a hanging-drop of glucose-broth have, however, the following characters, which differ in some respects from "Organism D."

Short chains, usually not more than 8–12 elements, strongly Gram-positive in young cultures, but variable in the chain in older cultures. Elements of the chain composed more often of diplococci with flattened opposed sides than of lanceolate forms. Both types are, however, seen. Growth on agar is slight or absent, but on serum-glucose-agar or blood media minute streptococcal colonies are obtained, round, discrete, and raised. The colonies appear slightly granular by transmitted light. They do not hæmolyse blood media. A slight granular deposit is formed in broth. The fermentation reactions are acid in glucose, lactose, and maltose, no change in cane-sugar, mannite, salicin, or inulin. Milk is acidified without clot. The reactions, therefore, differ slightly from those of Donaldson's organism.

The streptococci thus obtained by plating, and the staphylococcal forms, are not pathogenic to guinea-pigs. The pleomorphic bacillary form is also non-pathogenic to the guinea-pig.

It is of interest to note that by prolonged growth (7 weeks) in a glucose-broth hanging-drop, very minute coccal forms are obtained, reaching the limit of the microscopical powers available. Crookshank[6] has recently emphasised the possibility of a relation between filter-passers and non-filter-passers. It was noted in the Medical Review of the Foreign Press[8] that strangles has been transmitted by means of filtrates of infectious material, a disease associated with the *Streptococcus equi*, which resembles the pleomorphic organism of Rosenow.

It can be definitely stated, however, that the various forms described here are derived from the large oval spore and are stages in the growth of that organism. This suggests that influenza may be of mycotic origin. Further work is needed and is being carried out on the above organisms. A statement, however, of the results at present obtained seemed to be of value. I am indebted to Lieutenant-Colonel S. G. Butler, D.S.O., R.A.M.C., for facilities in connexion with this work.

References.—1. MacConkey: Quo'ed in Manual of Bacteriology, Hewlett, 1908, p. 370. 2. Donaldson: THE LANCET, 1918, ii., 723. 3. Harris: THE LANCET, 1918, ii., 877. 4. Bradford, Bashford, and Wilson: THE LANCET, 1919, i., 169. 5. Medical Supplement to the Daily Review of the Foreign Press, October, 1918, 359. 6. Crookshank: THE LANCET, 1919, i., 314.

THE RESULTS TO BE EXPECTED FROM ANTENATAL CARE.[1]

BY EARDLEY HOLLAND, M.D. LOND., F.R.C.S. ENG.,
PHYSICIAN, CITY OF LONDON MATERNITY HOSPITAL; ASSISTANT OBSTETRIC PHYSICIAN, LONDON HOSPITAL.

I HAVE lately become convinced that both the medical profession and the lay public have been engaged in so impetuous a pursuit of antenatal work that they have not paused to consider what results they are really justified in expecting from it. What is the extent to which stillbirth and infant disease and mortality may be reduced by antenatal work?

Some, and they are the vast majority, expect too much. They believe that by something wonderful, almost magical, in treatment by drugs, diet, rest, and general hygienic measures almost every fœtus doomed to death or disease may be made into a healthy infant. Others, who, I am glad to say, form a very small minority, are convinced that antenatal care will do positive harm by preserving the lives of those who would only become unfit and degenerate racial undesirables. It is easy enough to refute such a crude opinion as this, but the fact that it exists should make us all the more careful to be equipped with facts and figures in our advocacy of antenatal work.

The Need of Standardised Records.

The time has come for us to make an assessment of our antenatal work; to balance our accounts and to find out what are our profits in relation to our capital outlay and expenditure. The amount of time, energy, and labour put into antenatal work at the present day is very great. Do the benefits gained therefrom represent a big, a moderate, or only an insignificant profit? We have got to find out whether our results justify our work. This paper has been written with that object, though the facts at present at my disposal do not allow me to do more than generalise. I hope to show that the present rate of fœtal mortality is capable of being reduced by about one-half. But this end cannot be attained by antenatal methods alone; for not only are the majority of fœtal deaths beyond the realm of antenatal care, since they are the direct result of the accidents and complications of labour, but antenatal care itself depends for its successful fulfilment on a high standard of midwifery. Without wishing for a moment to minimise the importance of the antenatal period, I desire to draw attention to the even greater importance of the intranatal period of fœtal existence.

I should like to see records kept, on a standardised system, at every large maternity centre; this might well be insisted on by the State department which subsidises such centres. From the records of pregnancy, of labour, and of the year subsequent to labour, both for the mother and the infant, we should be able to state the profits of our enterprise. We should know how many fœtuses were saved from probable death during pregnancy, how many from death or injury during labour; how many mothers were spared serious illness, or possible death, from the diseases of pregnancy and the injuries of labour.

The only records of pregnancy that have been published on these lines, so far as I am aware, have come from the pregnancy clinic of the Boston Lying-in Hospital. Dr. F. S. Kellog considers what complications of pregnancy were found amongst 4996 cases. I will quote his own words:—

"Of these, 1524 showed some abnormality in pregnancy, 30 per cent.; albuminuria without other signs of toxæmia, 361, 7 per cent. of all cases, 23 per cent. of abnormal cases; elevated blood-pressure without other signs of toxæmia, 259 cases, 5 per cent. of all cases, 16 per cent. of abnormal cases; definite symptoms of toæxmia, 195 cases, 4 per cent. of all cases, 12 per cent. of abnormal cases; contracted pelvis of varying degree, 401, 8 per cent. of all cases, 26 per cent. of abnormal cases; heart lesions, 111 cases, 2 per cent. of all cases, 7 per cent. of abnormal cases; phthisis, 10 cases; antepartum hæmorrhage, 33 cases, which is 0·7 per cent. of all cases; pyelitis, 20 cases; syphilis 21 cases; gonorrhœa, 10 cases; chronic nephritis, 5 cases; diabetes, 3 cases; with occasional cases of fibroids in the lower segment, ovarian cysts, and other complications to the number of 30; also a large number of severe varicosities of the leg, and a small number of antepartum phlebitis. These figures establish the fact that pregnancy is not the normal physiological process it is so broadly considered, and that prenatal care is valuable in 30 per cent. of pregnancies that are in some degree abnormal; and that the only way to include this 30 per cent. is to give it to all; and that with 4 per cent. of all pregnancies showing definite toxæmic and pre-eclamptic symptoms, 2 per cent. of all pregnancies showing heart lesion, 8 per cent. of all pregnancies showing some degree of contracted pelvis, 0·7 per cent. of all pregnancies showing antepartum bleeding, to go no further, prenatal care is not only valuable, but is essential."

What is the Object of Antenatal Work?

Antenatal work has for its aim the great economic principle of the prevention of waste. I am here dealing only with the fœtus; the mother is another, a bigger, and—in my opinion—an even more important problem in relation to antenatal work. I will merely mention that maternal mortality and morbidity are enormously greater in cases of dead birth than of live birth. This is obvious, since the birth of a dead fœtus is usually the consequence either of a pregnancy disease or of a severe labour, with the added risks of maternal injury or puerperal sepsis.

Quite apart from the waste of infants, it does not need a professional economist to appreciate the waste involved by the birth of a dead fœtus. At the best there is a waste of time, a waste of energy, a waste of health, and a waste of money and material, distributed amongst the mother and family, the doctor, midwife and nurse, the National Health Insurance sickness and maternity benefits. At the worst there may be added to these permanent harm to the mother's health or even the loss of her life. The maternal mortality from childbirth is well enough known, but we have only a glimmering of the severe and slight illnesses that result from childbirth. We have not accurate figures for this, but they can and must be got. As some indication I have found that 40 per cent of the patients who come to my gynæcological out-patients' department at the London Hospital come because of some post-parturient disease, usually only of a minor nature, but all the same it is enough to produce temporary, if not permanent, discomfort, or invalidism, or sterility. The only thing that can convert waste into gain; that can compensate for the discomfort, expense, and danger of child-birth, is the birth of a healthy infant. This is the object of antenatal care.

Let us consider what influence the reduction of fœtal mortality is likely to have on the birth-rate. The desirability or otherwise of raising the birth-rate is a controversial point I will leave alone. The dead birth-rate for viable fœtuses is about 3 per cent. Supposing we could by antenatal work reduce fœtal mortality by one half, and thus cause an annual addition of about 12,000 infants to the population, would the birth-rate be thereby very much influenced? A birth-rate of 20 per 1000 would only be raised to 20 3. The reduction of the dead birth-rate by one half would be a most remarkable achievement, but it would only raise the live birth-rate by a fraction. If it is desirable to raise the live birth-rate there are quicker and more certain methods of doing so than antenatal care. There is a great deal of confused thought and loose writing about the tens of thousands of babies lost annually to the State from early abortion and dead-birth, excusable because it is good propaganda. The birth-rate is governed by profound economic factors beyond the influence of obstetrical science. If obstetrical science could bring it about that every conception reached healthy maturity the result would soon be a reduction in the number of conceptions.

[1] A paper read on July 1st at the National Conference on Infant Welfare organised by the National Association for the Prevention of Infant Mortality.

Importance of Improved Intranatal Care.

Leaving now the objects for which antenatal work strives, let us consider its results as regards fœtal life. I intend to arrive at the answer to the question, "What really are the results to be expected from antenatal care?" by the consideration of two points: the distribution of the causes of fœtal deaths amongst the 3 per cent. death-rate, and the preventive means at our disposal implied by the expression "antenatal care." We should thus be able to divide fœtal death into two classes, (1) preventable and (2) not preventable, always with the sure hope that by scientific research, the class "preventable" may be constantly recruited from the class "not preventable."

Fœtal death may occur during one of two periods: either during the long quiescent period of pregnancy, before the onset of labour—the antenatal period—or during the short stormy period of labour—the intranatal period. In the same way we must divide our preventive methods, our means for preserving the life and health of the fœtus, into two distinct classes—antenatal methods and intranatal methods. By intranatal methods I mean the management of labour, normal or complicated. One of the chief points I wish to make is the immense importance in the prevention of fœtal death of the management of the intranatal period. I do not hesitate to say that more fœtuses can be saved by improved intranatal care than by antenatal care.

If a series of cases of dead birth be investigated the first great fact to become clear is that more fœtuses are killed during labour from injury or accidental complications than die during pregnancy from fœtal or maternal disease. A fœtus that dies during the antenatal period is usually born in a state of maceration; one that dies during the intranatal period is in a fresh condition.

Out of every 100 dead-born viable fœtuses you will generally find about 60 fresh and 40 macerated. Although the fresh fœtuses will include a few that have died from antenatal causes shortly before the onset of labour, it is reasonably accurate to state that 60 per cent. of fœtal mortality is due to the accidents and complications of labour. In other words, 60 per cent. are cases of intranatal death and 40 per cent. of antenatal death. This alone is an indication of the immense importance of improved intranatal methods for the reduction of fœtal mortality.

Relation of Antenatal to Intranatal Work.

Another point which leads to the same conclusion is that antenatal work depends on a high standard of intranatal work for the fulfilment of its aims. Antenatal work is the strategy, intranatal work the tactics of preventive obstetrics. Consider for a moment the investigations we make at an antenatal clinic: (1) We measure the pelvis and estimate the relative sizes of the pelvis and fœtal head, for we know the disasters of labour with a contracted pelvis; (2) we find out the presentation of the fœtus, for we know that breech-labour has an apppeciable fœtal mortality; (3) we test the urine, for we know the consequences of untreated toxæmia of pregnancy; (4) we get the history of former pregnancies and labours, which often puts us on the track of syphilis; (5) we examine the pelvic cavity for obstructive tumours; (6) we investigate the general health of the mother, though we know that, with rare exceptions, the only unhealthy states of the mother, apart from the toxæmia of pregnancy, that cause fœtal death are syphilis and renal disease. The list seems short enough, but its length is by no means commensurate with its great importance.

Now let us consider the treatment we adopt as the result of the above investigations. We find it is chiefly intranatal. The only purely antenatal treatment consists in the treatment of syphilis and in the treatment of the appropriate cases of toxæmia of pregnancy or of chronic renal disease by the simple means of diet, rest, and aperients. Otherwise we depend on the induction of premature labour, Cæsarean section, or on the careful management of labour with instrumental assistance when occasion demands.

Causation of Fœtal Death.

I will now deal with the causes of fœtal death and will try to indicate how many deaths are preventable, with special reference to the value of antenatal care in achieving this object. There is no need for me to enter in detail into these causes, for this part of the subject has already been dealt with by Dr. Amand Routh.

Taking first the macerated fœtuses we can distribute them into the following groups: Syphilis, toxæmia of pregnancy, chronic renal disease, relative placental insufficiency from abnormal smallness of the placenta or excessive infarction, separation of the placenta by retroplacental hæmorrhages, and a great group in which the cause of death is undeterminable. Syphilis heads the list of deaths amongst macerated fœtuses with 34 per cent., toxæmia of pregnancy comes next with about 20 per cent.; then comes the disappointing group with cause undetermined, about 20 per cent. We can place relative placental insufficiency and retroplacental hæmorrhage at about 18 per cent., and distribute the remainder amongst chronic renal and other maternal diseases and severe fœtal deformities.

Turning now our attention to the fresh fœtuses we shall find that in most of these death is due to the injuries and accidents of labour. There is a certain number due to the causes I have enumerated under the macerated fœtuses, such as toxæmia of pregnancy or retroplacental hæmorrhage; cases in which the fœtus died shortly before its birth and before it had had time to become macerated. Amongst these fresh fœtuses we find that placenta prævia, accidental hæmorrhage, instrumental or natural delivery through a contracted pelvis, breech presentation, delivery by version, delayed labour from whatever cause, prolapse of the cord account for all but a very few. The most striking fact of all is that about one-half of these fresh dead-born fœtuses show, on post-mortem examination, severe cerebral injury in the form of cerebral hæmorrage and tearing of the septa of the dura mater; such injuries could only be caused by excessive cranial stress during labour.

Consideration of Causes of Fœtal Death in Regard to Prevention.

I will now try to work out how many of these fatalities are preventable. It will be noticed that I have not attempted to give the ultimate causes of fœtal death, but have only placed the cases in broad clinical groups. In giving the percentage frequency of each group I shall again only give approximate figures. This rough method is quite sufficient for the purpose, as I can only hope to indicate what can be done in a general, and not in a precise, way. For the purposes of preventive treatment we can conveniently place all cases of fœtal death into four groups:—

1. Those, the cause of which can be discovered during the antenatal period and can be prevented by purely antenatal treatment. The great representative of this group is syphilis. Another example is toxæmia of pregnancy, many cases of which can be kept within reasonable bounds, or even cured, by simple antenatal treatment. Still another example is breech presentation, for which we can perform external version.

2. Those, the causes of which can be discovered during the antenatal period, but which depend for their prevention on intranatal methods. The best example of this is contracted pelvis. If discovered early enough in pregnancy the obstetrical treatment can be planned, and will be either waiting for natural labour, with the help of forceps if necessary, or induction of premature labour, or Cæsarean section. Another example is afforded by those cases of toxæmia of pregnancy which do not yield to antenatal treatment and which must be treated by induction of premature labour. Another rare example is obstructive pelvic tumours.

3. Those, the causes of which are not discoverable in the antenatal period, but which make their presence known just before or coincidently with the onset of labour, or during the course of labour. Examples of this group which are prolific of fœtal death are the antepartum hæmorrhages. Other common ones are prolapse of the umbilical cord, cases of prolonged labour from such causes as persistent occipito-posterior presentations. In this group most of the fœtuses have cerebral hæmorrhage and tearing of the septa of the dura mater, consequent on delivery by forceps or version.

4. Those, of which the causes, so far as our present state of knowledge stands, are not discoverable or preventable by any means whatever. These include the great group in which the cause of fœtal death cannot be determined, the cases of relative placental insufficiency due to abnormal smallness of the placenta or to the destruction of a large area of placenta by infarction, those cases in which a blood-clot is found behind the placenta, and cases of severe fœtal deformity such as anencephaly, hydrocephalus, and œdematous states of the fœtus.

The Respective Value of Preventive Methods.

I will now attempt to make a rough estimate of how many fœtal deaths are preventable and how many are not preventable, and will give a rough indication of the preventive part played by antenatal methods alone, by combined ante- and intranatal methods, and by intranatal methods alone.

—	Incidence.	Preventable.	Antenatal.	Ante- and intranatal.	Intranatal.
Syphilis	15	15	15	...	...
Toxæmia of pregnancy ...	10	6	3	3	...
Complications of labour (including antepartum hæmorrhage)	50	30	1	9	20
Chronic renal and other maternal diseases ...	2	1	1	...	...
Cause undeterminable ...	12	0	...	...	...
Relative placental insufficiency and retroplacental clot	6	0	...	...	...
Fœtal deformities	5	0	...	...	...
—	100	52	20	12	20

It is thus demonstrable that out of the 50 per cent. of fœtal deaths which are theoretically preventable, about 20 per cent., of which three-quarters are syphilis, could be prevented by antenatal methods alone. We see that 12 per cent. depend for their prevention on combined antenatal and intranatal methods, and 20 per cent. on intranatal methods alone.

The point to which the foregoing line of reasoning has brought us is that although antenatal work is of immense importance, and we must not abate by one jot our enthusiasm for it, yet the importance of the intranatal period and the necessity of getting a better standard of midwifery must be recognised much more than it is at present. This conclusion is forced on us when we realise that the majority of dead fœtuses have met their death in the intranatal period, that many cases of intranatal fœtal death occur from causes beyond the control of antenatal care, and that antenatal care itself depends on intranatal skill for its successful issue.

In conclusion, I would appeal to this great National League, which has already done so much for maternity and child welfare, to use its influence in helping to bring about a higher standard of midwifery practice—an end which can only be attained through the better teaching of midwifery to medical students, midwives, and post-graduates alike, and by the establishment of enough maternity homes and hospitals to meet the needs of our population.

PNEUMOKONIOSIS IN MAN AND HORSE.

By W. C. RIVERS, M.R.C.S., D.P.H.,

TUBERCULOSIS OFFICER, BARNSLEY DISTRICT, WEST RIDING, YORKS.

WHEN dealing with nasal defect and mouth-breathing [1] as contributory causes to pulmonary tuberculosis I brought forward among a priori arguments the fact that the Equidæ, which breathe exclusively by the nose, very rarely suffer from tuberculosis (especially the pulmonary form), although no better housed than cattle, which are very subject to that disease and possess an air-way by the mouth. The thought occurred that it would be interesting in this connexion to test the comparative incidence of pneumokoniosis in man and horse working in dusty occupations, as in coal-mines. Accordingly, investigation and inquiry were begun.

Views of Various Investigators.

Veterinary authorities agree that pneumokoniosis is very rare in horses. Smith [2] says: "There is no such thing as miners' lung amongst them (coal-pit ponies), though many never come to the surface for years." Coal-dust is not mentioned amongst the causes of equine interstitial pneumonia in Friedberger and Fröhner's work.[3] It is put last in the list of such causes by Hoare,[4] and pneumokoniosis is stated to be only an occasional form of equine chronic pneumonia.

Professor McQueen of the Royal Veterinary College, Camden Town, kindly informed me that miners' lung was very rare in pit ponies. He added that an unpublished post-mortem investigation of pit ponies' heads (in relation to possible penetration of the facial sinuses by the coal-dust) revealed that the dust was nearly all stopped at the nose. Messrs. R. C. Trigger and W. Trigger, F.R.C.V.S., who furnished the material, told me that, clinically, any lung disease is highly uncommon in pit ponies, who nearly all cease work from old age. The latter added, however, "Post-mortem examination often reveals extensive anthracosis in an otherwise perfectly healthy lung and no symptoms in life."

Other sources.—In the Rand gold-mines, so Mr. Alex. Richardson kindly writes, no animals are used for haulage purposes; some years ago a few mules were employed, but nothing is discoverable as to their health. Dr. Johnson [5] kept white rats continuously down a Witwatersrand mine in the dustiest spot, their conditions of life being much worse than those of the miners. They developed silicosis but not tuberculosis; their general health was quite unaffected. Rats breathe through the nose exclusively. In a discussion following this paper the opinion was expressed that if the rats had been brought up out of the mine regularly like the men they would have developed hardly any silicosis in five years.

In Cornwall, Dr. Tonking, whose work on the local miners' phthisis is well known, tells me that there are no ponies underground in the Camborne district. In the St. Just area one mine uses them, but there, so Dr. Nesbitt is good enough to report, no silicosis or miners' phthisis exists, save a few cases returned from South Africa.

At Gartverrie, Scotland, the manager of the ganister-mine there (ganister, a component of firebrick, &c., is a great source of silicosis) tells me that men and horses work practically in an open quarry and that silicosis in either is unknown.

In a discussion following a paper by Dr. Haldane, F.R.S.,[6] Sir H. Cunningham said the dust of the mines—this dust was not only coal, but also stone or shale put down to lessen risk of coal-dust explosions—did not hurt the pit ponies. Another speaker instanced a pony which had worked in very dusty parts of a mine for many years. It was shot, and on examination no dust was found in the lungs. Dr. Haldane related having examined coal-pit ponies killed in an explosion, and having been struck with the small amount of dust in their lungs, which were comparatively pink. He supposed that the ponies' noses filtered the dust off. Pit ponies all looked well and lived for many years.

Lastly, there is the case of the great Alpine tunnels, in making which men and horses were employed; it is certain that formerly both suffered a high mortality. The causes of death in the men are given as ankylostomiasis and "acute bronchial and pulmonary catarrhs." There is little mention of tuberculosis or chronic pulmonary disease. What the horses died from I have not been able to ascertain. But it is stated that there was a very high CO_2 content in the tunnel air, often exceeding 15 per 1000, so that the railway metals were chemically affected. This would probably lead to acute pulmonary ailments in the horses too; a certain incident related to me in connexion with coal-pit ponies seems, at any rate, to suggest so.

Author's Investigations.

My district contains many mines.

Coal-mines.—I have visited three, one employing over 200 ponies. What I heard and saw, with one exception, entirely confirmed the preceding literature. There were no lung ailments among them; they were hardly ever sick; they were invalided for old age; their average working life was 13 years; and so on. Certainly they all looked fat and well, and did not cough; many were obviously old. They never came to the surface except during a strike. The exception spoken of was that in one pit the stables had once, for the sake of proximity to work, been put in the "return" air-way. The ventilation of a coal-mine is artificial, and for this

[1] Three Clinical Studies in Tuberculous Predisposition. London: Allen and Unwin. 1917.

[2] F. Smith: A Manual of Veterinary Hygiene, London, 1905.

[3] Friedberger and Fröhner: Veterinary Pathology, translated by M. H. Hages, London, 1905.

[4] E. W. Hoare: A System of Veterinary Medicine, ii., 889.

[5] J. P. Johnson: Journal of the Chemical, Metallurgical, and Mining Society of South Africa, March, 1917.

[6] J. S. Haldane: The Effects of Dust Inhalation, Institution of Mining Engineers Annual Meeting, London, June, 1918.

purpose there are mostly two sides to a mine, separated by a double set of doors having a dead space between. On the one side is the incoming good air from the surface, on the other the outgoing or return current. The latter is stated not to be more dusty than the former, but to contain some CH_4 and a higher percentage of CO_2. After these ponies had lived for a little in this chemically somewhat deteriorated "return" air, against which the nasal filter would be no protection, they panted and wheezed, and one or two died. On changing the stables back to the intake air-way the ponies regained their health. It is allowable to suppose that a good deal of the equine mortality in the old Alpine tunnel-making arose in this way.

Ganister-mines.—I have visited six mines and made inquiries as to six more. Of these 12, four employed ponies underground; the largest number at any pit was five. The reports were that the health of the animals was excellent. However, it appeared that the conditions as regards possibility of dust inhalation were better for the ponies. They being required for traction purposes, waited in the roadway while the men were engaged at near quarters with the mineral. This was so at three of the four mines, including the one in which human silicosis was most common. At the fourth the conditions under which human and equine workers were employed were described as being about equal. At this place it was claimed that an improved system of ventilation had practically abolished silicosis, but I was told that when the disease was common in the men nothing analogous was noticed in the ponies, and a mule had worked for 20 years in good health. In all these ganister-mines the ponies, unlike coal-pit ponies, were stabled above ground, coming up after a shift of work. The shallower depth and smaller extent of the workings facilitated this practice.

Conclusions.

It will be admitted that the trend of the above evidence is in favour of horses being much less liable to pneumokoniosis than man is, and that there is some reason to think their exclusive nasal breathing responsible for this. With this result may be usefully coupled another similar one already mentioned—namely, that horses are also much less prone than man is to tubercle, especially pulmonary tubercle.

Does the same explanation hold? At all events, it is made more likely by the way this comparison of human and equine pneumokoniosis has turned out. Laboratory experiments on phthisiogenesis have often consisted in making animals inhale or ingest dust, and mine experience is obviously superior, in actuality and correspondence to natural conditions, to laboratory experiment. Parenthetically, it contradicts the conclusions of the school of Calmette as to the alimentary origin of pulmonary tubercle, conclusions already assailed by Cornet, a fellow bacteriologist. For these coal-pit ponies, although their food is now brought down fresh to them every day or two, must, by living in a coal-pit for years and champing their bits when at work, swallow great quantities of coal-dust; they must swallow much more than the men do. Yet Dr. Haldane finds their lungs much less black than the men's.

The freedom of horses from pulmonary tubercle cannot, on the other hand, be explained by specific humoral insusceptibility, as witness the experiments of MacFadyean, Ravenel, and Griffiths of artificial inoculation of horses with tubercle, in which copious pulmonary lesions were produced or fatal results reached. Again, specific humoral insusceptibility to tubercle would explain nothing of horses' freedom from pneumokoniosis. Exclusive nasal respiration will explain both, and in addition the especial rarity of the pulmonary location of natural equine tuberculosis.

So much for deductions as to the pathogeny of tuberculosis and ordinary consumption. As for the bearing upon silicosis and miners' phthisis, it would be of advantage to have more observations. The number of ganister pit-ponies is so very few, seeing that the district I have spoken of contains the majority of these mines in the whole country. Something should be learnt from exposing ponies or mules to the same conditions in South African and Cornish mines as produce human miners' phthisis, or to rather more severe ones. The white rat is not a good animal for experiment in this connexion, it being notoriously resistant even to artificial inoculation with tubercle[7]; whereas horses are distinctly less difficult.

[7] See Cobbett: The Causes of Tuberculosis, Cambridge, 1917, p. 444.

In the prophylaxis of the grave South African silicosis it might be worth trying if measures like oral obturators, as also nasal irrigation after work, were possible in practice. In the few cases of clinical anthracosis and typical fibroid phthisis (other than those in men who work in stony parts of the mine, roof tenders, and so forth) that one meets with in colliers, I have been struck with the frequency with which such subjects showed a wide atrophic nose, which would be useless as a dust-filter. The effect of all continuous dust inhalation is to cause some slight degree of intranasal atrophy, but if a man came to this work already nasally atrophic his lungs would obviously be at a great disadvantage. Saenger[8] said that in workers in dusty trades those with wide nasal passages showed dust in the respiratory tract as far down as the trachea, which was not the case when the nasal fossæ were of normal size.

I wish to express thanks to all of my informants.

[8] Saenger: Centralblatt für Innere Medicin, March 19th, 1898, No. 11.

TUBERCULOSIS FROM A WEST INDIAN STANDPOINT.*

BY JOSEPH GEOGHEGAN, M.B., F.R.C.S.E.,

TEMP. CAPTAIN, R.A.M.C.; SURGICAL SPECIALIST, BELFAST DISTRICT; LATE GOVERNMENT MEDICAL OFFICER, TURKS ISLANDS, ETC.

THE Turks and Caicos Islands form the southern end of the arc of the Bahamas, but are attached to the government of Jamaica. Grand Turk is the capital. The population, of 5615 by the Census of 1911, is of the usual original negroid stock with, in cases, a dilution of white blood; there are a small number of whites to whom the remarks here made do not apply. The people are of a hardy, sturdy type, usually good boatmen, living by work on the salt-ponds—which give the staple product of the Dependency—sponging, and plantation labour, the last in a restricted and limited way. The islands are very barren; water is scarce, largely dependent on the small rainfall. The climate is warm but tempered by cool trade winds.

Mortality from Tuberculosis.

During the quinquennium 1909–13, of the total deaths registered in Grand Turk, the percentage recorded as due to tuberculosis was 14·4, indicating about 4 per 1000 of the population. No information is available as to the other settlements of the colony as a whole.

The corresponding rate in England is under 1. In the 15 largest towns of Scotland the quinquennial rate[2] at slightly over 1½ (1·6) is the same as that for the United States of America.

Comparison instituted between these figures and West Indian statistics is not to the benefit of the latter. In Jamaica[3] the death-rate per 1000 is under 2; 3·5 for Kingston. In Grenada[4] for quinquennium to 1913 the percentage of deaths due to tuberculosis was 5·72; 10·41 for the town of St. George. In St. John's, Antigua,[5] 6·13 per cent. In Trinidad (and Tobago)[6] for quinquennium (1909–13) 2·1 per 1000; 5·2 for the capital, Port of Spain. In the Bahamas the disease is said to be rife. Dr. Godfrey[7] points out for British Guiana that—

"the crowded villages near Georgetown and along the west bank of the Demerara River show phthisical death-rates of 4·2 and 4·3 per 1000 living, while the less crowded and scattered villages of the east bank and of the sea-coast have lower rates, 2·2 and 2·8 respectively. On the sugar plantations, where overcrowding is forbidden and where regular life obtains, the average phthisical death-rate during the years 1907 to 1910 is 1·15 per 1000, while in 1911 the rate is 0·9, which compares most favourably with any civilised country."

The histories of two families illustrate certain aspects of the question; the number could be readily amplified.

Summed up, there is in one family the case of a girl dying of the disease; her mother is now affected; amongst the family a young man, her uncle, dies of the disease, followed in succession by his father and his sister, his sister's fiancé being left tuberculous.

In the second series instanced the disease commences in the death of a young man; then follows in fatal sequence

* Abridged from a report submitted to the Colonial Office.

first the father, then a brother, then a sister, all living and dying in the same house, and leaving affected a sister from the house and a brother living elsewhere. I have not been able to gain precise information as to how long the last has been in existence, but, be it the origin or the result, the inference remains.

In neither of the series recorded is hereditary predisposition or transmission suggested or known to my information, but in the distinct lines of infection illustrated is shown the impress of other factors.

Causation.

All West Indian observers agree in the opinion that the incidence of phthisis pulmonalis greatly overweighs other tubercular diseases which are comparatively infrequent. In this Dependency only two joint affections have come under my notice in nearly four years' experience, and the glandular condition is but seldom noted. The boiling of milk is extensively practised in the West Indies; in Turks Islands tinned milk is almost solely depended on. Though the infantile mortality rates in the West Indies are admittedly high—in Turks Islands for 1914 and 1915, 204 and 229 respectively—there are other factors applicable of a certain importance.

In view of the negligible appearance of the condition in children,† and of the precise fields of the respective bacilli, such a sweeping statement that all tuberculosis commences in infancy (Behring [9]) may have an element of truth in it, but it has no minimising influence on the fact that pulmonary tuberculosis is under suitable environment highly contagious in the adult. Accentuation is lent to the question of direction of contagion by recent views on the respective spheres of influence of the human and bovine forms of the bacillus. The great preponderance of the human type in the sputum of phthisis pulmonalis is emphasised by A. S. Griffiths.[10]

It may therefore be concluded that it is to the human type that the prevalence of pulmonary tuberculosis in the West Indies is due. The mode of spread is apparent. Given an original focus, with or without a susceptibility, hereditary or racial, the disease is maintained by direct infection in virtue of the general ignorance of hygiene, in particular, the closing of every door and window at night, and the stopping up of nooks and crannies. This is common throughout the West Indies. Only prolonged perseverance can overcome the hatred of fresh air at night.

Other factors may be briefly scanned. All the West Indian towns have high rates as contrasted with the country districts. Reliable information is not to hand, but the house ratio in Grand Turk is 4·7 by a recent census. Overcrowding would not seem to present locally the terrible features of slum life in greater centres. As a concomitant to overcrowding it will be obvious that when a water-supply is inadequate or defective for any reason personal cleanliness may not be of a high order. The intimate association in thoroughly unhygienic sleeping-places of a number of individuals leaves little to be desired from the point of view of the bacillus.

Poverty is an important aspect. The West Indies possess a varied and rich dietary scale, but in Turks Islands the food as a whole is limited in variety, inferior in nature, and deficient in freshness. Starchy foods predominate and proteins are limited. If any influence can be attributed to food as a causative factor in tuberculosis, the dietary habits common to the West Indies may permit views palpably in alignment with those culminating in Philip's Zomotherapy.

Sanitary conditions leave much to be desired. Public or personal hygiene is unknown in the class forming nine-tenths of the population, but in all distant and small areas sanitation is a vexatious problem.

The Question of Prevention.

The figures quoted are solely derived from the comparative death-rates, and case-mortality will vary under the effects of administrative control and therapeutic advantages. In England it is said that, subject to surveillance from a reasonably early stage, a high percentage of cures may be expected. Grant Andrew,[11] in his careful résumé of a long series of hospital figures, out of 800 cases records a mortality of only 19·3 per cent. Recent administrative attention cannot fail to have a repressive influence on the existence of a disease so common that no middle-aged person but bears the stigmata of infection. It is only fair to contrast the West Indies in the possession of the necessities of therapy in this direction with Victorian England, and to express the hope that a similar impetus of attention will give commensurate results.

The present case-mortality amongst those of negro stock in the West Indies is admitted by all observers to be indubitably high. Osler points out that the negroes in the Southern States have an extraordinarily high death-rate, especially in the cities. Of eight cases seen in sequence in 1915 in Turks Islands, all in an early stage (save one from abroad who is now alive) and all under constant supervision, no less than six were dead by March, 1916. Phthisis in Turks Islands has a most fatal complexion. Rather than that the disease is universal and widespread, the view should be taken that it is more fatal than frequent.

West Indian tuberculosis stands, therefore, in certain respects in contrast with English. This point is of high importance, since it must presumably be correlated either with an absence of therapeutic possibilities or with a special lack of immunising power in the negro. Whatever relation subsequent research establish, there can be no question but that attention to personal hygiene and public health must have a marked effect. Backward the West Indies may be at present, but the efforts recently begun cannot fail eventually to produce good results. Methods dissimilar to those suitable for England are needed. The people are a different race and must be approached in a more elementary manner. The actual infective danger of phthisis is decidedly greater than in England, from deficient sanitation, from hygienic ignorance, and from greater susceptibility; phthisis is, further, the stronghold of tuberculosis in the West Indies, and once successfully combated the other forms do not seem likely to give rise to serious concern.

The presence of such devitalising influences as malaria and ankylostomiasis and the difficulties of administration are not lightly to be ignored. Taking everything into consideration it must be admitted that the death-rates, while in cases remarkably low, preserve a fair average. St. Lucia with 17·4, St. Vincent with 17·56, Grenada with 19·27, Cayman Islands with 7·1, and Turks and Caicos Islands with 14·0, may be placed in contrast with Jamaica with 25·1, the Bahamas with 26·7, British Honduras with 24·2, and British Guiana with 29·2,[12] but there are usually special circumstances applicable in each case which must modify any stricture. The references indicate that the West Indies cannot be expected at present to maintain other than a fair standard. There is a fruitful field for investigation in the comparative study of tuberculosis in the different colonies, of which certain features in common have already been established.

Consideration of any tropical problem cannot fail to recur to the question of climate. It is, I believe, accepted that climate has little or no relation with the causation of tuberculosis. Taking, however, such a group as the Turks and Caicos Islands, even granting the unfortunate series of conditions noted, where the days are almost perpetual sunshine—perhaps the best and certainly the cheapest disinfectant known—there is an inclination to demand greater confirmation of such a statement. The effect of a few degrees of latitude on the sum of the obscure metabolic processes that make up life is well exhibited in the biological adaptations to very varying conditions that will readily recur to the mind. Man and the tubercle bacillus inhabit the known world, though it is said that the Bedouin of the Sahara and the Eskimo of the Far North are free of such an unnecessary adjunct. Is a tropical climate better suited to the tubercle in the lung or to the tubercle bacillus? Or is it that, in the extra-corporeal life of the bacillus, there is an optimum of climate for the parasite as well as for the host, which need not necessarily coincide?

References.—1. Proceedings of the First West Indian Intercolonial Tuberculosis Conference, Trinidad, 1913. 2. Glaister: Text-book of Public Health, p. 430. 3. Proceedings, &c., p. 21. 4. Ibid., p. 28. 5. Ibid., p. 57. 6. Ibid., p. 99. 7. Ibid., p. 87. 8. Ibid., p. 122. 9. Behring: Quoted in Quinquennium of Medicine and Surgery, 1906–10, p. 375. 10. Griffiths: Tubercle Bacilli Derived from the Sputum, THE LANCET, 1916, i., 723. 11. J. Grant Andrew: Age, Incidence, Sex, and Comparative Frequency in Disease, p. 232. 12. See Colonial Reports for St. Lucia, 1913, p. 19; St. Vincent, 1913–14, p. 24; Grenada, 1913–14; Cayman Islands, 1912–13, p. 13; Jamaica, 1913–14; Bahamas, 1912–13, p. 18; British Honduras, 1913, p. 17; British Guiana, 1912–13, p. 23.

† I have never seen a case of abdominal tuberculosis in the Turks and Caicos Islands.

INFLUENZA-PNEUMONIA:

THE BACTERIOLOGY OF THE COMPLICATIONS IN FATAL CASES.

BY OLIVER HEATH, M.A., M.B., B.C. CANTAB.,
CAPTAIN, R.A.M.C. (T.C.).

(*From the Laboratory of the 5th Northern General Hospital.*)

FROM the recent preliminary publication by Rose Bradford, Bashford, and Wilson [1] it appears that they have definitely unearthed the prime causal organism of the late "influenza" epidemic. On the other hand, it is not so obvious that this "filtrable virus" is the cause of the numerous deaths.

The work here recorded was commenced in October, 1918, when the epidemic had reached serious proportions in the area served by this hospital. It was undertaken solely with the idea of determining and isolating the micro-organisms responsible for the fatal cases, with a view to preparing an efficient vaccine for prophylactic and curative purposes. Attention was concentrated mainly on material obtained post mortem as soon after death as "leave" could be obtained, and on specimens of the serous fluids taken during life with aseptic precautions. The examination of sputa was not followed up to any great extent owing to shortage of staff, and because it was noticed early that frequently the most serious cases did not expectorate.

Bacteriological Findings.

Post-mortem examinations.—The bacteriology of the pericardial and pleural fluids and the lung "juice" or pus is recorded below. Four points attracted notice: 1. The frequency with which fluid was found in the serous cavities. 2. The invariable presence of red blood cells in the serous fluids, with a variable "quantum" of pus and living bacteria. 3. The large proportion of fatal cases which came from "low category" units—10 out of 16. 4. The frequency with which pneumococcus, streptococcus, or a diplo-streptococcus was isolated: from all except one, and in this one pneumococci were seen in the films, but the cultures were overgrown by a coliform *B. Morgan* No. I.

In the British and foreign press attention has been directed to hæmorrhagic lesions of the serous membranes. Attention is here drawn to the frequency with which one finds, post mortem, an "inflammatory" fluid, containing living bacteria, in both pericardial and pleural fluids.

The type of coccus referred to as a "diplo-streptococcus" was a Gram + coccus, usually strongly capsulated, frequently lanceolate and suggesting pneumococcus, more often rounded, but often (especially in lung "juice" or pus) showing chain formation. Pleomorphism was marked. Large and small cocci, Gram + and Gram − cocci, and large round or pear-shaped forms—"involution forms"—have all been seen in one chain of cocci. In one sputum films showed only large pear-shaped forms, while the cultures yielded a nearly pure growth of this "diplo-streptococcus." In culture this coccus grew best on media containing blood, more sparsely on agar. The colonies are pyramidal and gelatinous-looking, and about the third day are flattened with a central "boss" which may disappear later. Occasionally gelatinous lumps form, giving the appearance as if one had broken the medium in planting the culture.

The results obtained from these examinations are now set out, the organisms isolated being indicated under (*a*) pericardium, (*b*) pleura, and (*c*) lungs:—

No. 1 (aged 23).—(*a*) and (*c*) Pneumococcus (pure); (*b*) −.
No. 7 (aged 19).—(*a*), (*b*), and (*c*) Pneumococcus.
No. 16 (aged 19).—(*a*) Pneumococcus (pure); (*b*) −; (*c*) *B. influenzæ*, pneumococcus.
No. 17 (aged 30).—(*a*) and (*b*) Pneumococcus (pure); (*c*) pneumococcus, *B. influenzæ*.
No. 18 (aged 28).—(*a*), (*b*), and (*c*) Pneumococcus.
No. 19 (aged 27).—Pneumococci seen in films from plate, but all cultures overgrown by *B. Morgan* No. I.
No. 23 (aged 20).—(*a*) Staphylococcus, diplo-streptococcus; (*b*) −; (*c*) diplo-streptococcus, *M. catarrhalis*.
No. 24 (aged 20).—(*a*) and (*b*) Pneumococcus (pure); (*c*) pneumococcus, *B. influenzæ*, *M. catarrhalis*.
No. 40 (aged 35).—(*a*), (*b*), and (*c*) Diplo-streptococcus.
No. 41 (aged 19).—(*a*), (*b*), and (*c*) Diplo-streptococcus.
No. 42 (aged 38).—(*a*), (*b*), and (*c*) Diplo-streptococcus.

[1] THE LANCET and Brit. Med. Jour., February, 1919.

No. 51 (aged 40).—All cultures yielded diplo-streptococcus, a short streptococcus, a small Gram − coccus.
No. 56 (aged 27).—All cultures yielded streptococcus, staphylococcus, *M. tetragenus*.
No. 57 (aged 25).—(*a*) Staphylococcus; (*b*) staphylococcus, *M. catarrhalis*, a streptococcus; (*c*) (unfinished owing to illness).
No. 58 (aged 51).—All cultures yielded diplo-streptococcus and a few colonies of staphylococcus.
No. 60 (aged 30).—All cultures yielded diplo-streptococcus, a streptococcus, staphylococcus.

The sputa of five of the above were examined during life.

No. 7.—Minute quantity. Purulent. Many pneumococci seen in films and isolated in pure culture.
No. 16.—Purulent. Many *B. influenzæ* and a few pneumococci in films; both isolated in pure culture.
No. 19.—Purulent. Pneumococci seen in films of sputum and of plate-cultures, but cultures overgrown by a coliform bacillus.
No. 40.—Slightly purulent. The *M. catarrhalis* and a few pneumococci seen in film. Pneumococcus isolated in pure culture.
No. 51.—Mucopurulent. A few cocci resembling pneumococci seen in film. Cultivations not made.

Bacteriology of serous fluids during life.—Two examinations were made of pericardial and two of pleural fluids taken during life. The findings are now shown.

No. 12 (aged 34).—Fluid from pleura; purulent ++ pneumococcus seen; pneumococcus isolated.
No. 39 (aged 26).—Fluid from pericardium; purulent ++; diplo-streptococcus, streptococcus, and staphylococcus isolated (two examinations).
No. 50 (aged 25).—Fluid from pleura; slightly purulent; staphylococcus and diphtheroid bacillus isolated.

Notes on above cases:—

No. 12.—Sputum mucopurulent. Pneumococcal-like organisms not seen. Cultivations not made. Patient recovered.
No. 39.—Sputum purulent. Diplococci resembling pneumococci seen in film. Cultivations yielded a nearly pure growth of the diplo-streptococcus. Patient died.
No. 50.—Sputum contained fresh blood and clots, and was purulent. Later was only purulent. Cultivations yielded a streptococcus and a diphtheroid bacillus. Patient eventually developed a gangrenous cavity in the lung.

Examination of sputa.—Forty-six were examined, and cultivations made from 20 of these. Organisms isolated were: Diplo-streptococcus or pneumococcus 19, streptococcus 1, *M. catarrhalis* 4, *B. influenzæ* 3, a diphtheroid bacillus 2.

In film preparations from all cases (46): Cocci resembling pneumococci seen in 44, bacilli resembling *B. influenzæ* in 7, *M. catarrhalis* in 8.

Summary.

1. Pneumococcal or streptococcal organisms were found in all of 16 post mortems; in 2 out of 3 serous fluids taken during life; and in 19 out of 20 sputa examined bacteriologically.

2. Emphasis is laid on the hæmorrhagic and infective nature of the fluids found post mortem.

3. Attention is drawn to the high percentage of fatal cases which came from "low category" units.

A MEETING of the medical practitioners of Blackpool, including members of the British Medical Association and non-members, was held at the Town Hall, Blackpool, on July 2nd. Dr. W. J. McL. Baird, honorary secretary of the Blackpool division of the British Medical Association, was in the chair. Among other matters considered by the meeting, Dr. John Brown brought forward the "forthcoming election of Direct Representatives on the General Medical Council." He said that, judging from a paragraph in the *British Medical Journal* of June 28th, the Association intended to run as its candidates the four gentlemen who were its nominees in the last election. He protested against the action, as he thought it unfair for the Association to monopolise the representation of the general practitioner, particularly as the Association did not represent more than half the profession, and many of its members were not in accord with its policy. The secretary for the Blackpool division said that out of some 120 medical men in the area of this division only 39 were members of the British Medical Association. The meeting unanimously resolved to support Dr. Brown if he decided to stand as a candidate.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF ACUTE SEPTIC MENINGITIS OF OTITIC ORIGIN; COMPLETE RECOVERY.

BY J. ARNOLD JONES, O.B.E., M.B., CH.B. MANCH., F.R.C.S. EDIN.,

LATE TEMP. MAJOR, R.A.M.C.; AURAL AND LARYNGEAL SURGEON TO THE BRITISH FORCES IN MACEDONIA; SURGEON TO ST. JOHN'S HOSPITAL FOR DISEASES OF THE EAR, MANCHESTER, ETC.

THIS case is chiefly remarkable because of recovery.

The patient was admitted into hospital under my care on March 26th, 1918. A mastoid operation had been performed at a casualty clearing station 14 days previously. The notes stated that he had had sudden pain in the right ear with discharge; was delirious for a few hours; vomited. At the operation "offensive material" was found in the antrum and cells.

On admission on March 26th patient complained of headache and pain in the ear. Pus was freely draining through a small tube issuing from the mastoid incision and also from external meatus. Temperature, 99° F. No history of old-standing ear disease. On a daily antiseptic toilet the antro-tympanic cavity cleared up, and progress was good in every way. On May 14th he had an attack of benign tertian malaria which responded readily to quinine. From the 19th to 24th, diarrhœa; stools negative to bacilli and protozoa. On last date diarrhœa had ceased; complaint of headache and some aural pain; slight mastoid tenderness. Temperature rose to 100°. On the 25th temperature normal, but other symptoms had increased. From examination with aural speculum it was difficult to make out the anatomy of the operation cavity, so I reopened it under general anæsthesia. The antrum and tympanum had been thrown into one cavity and their roofs were absent, exposing a large area of dura covered with granulations. The antro-tympanic cavity was thoroughly cleansed and enlarged. No pus was found.

On May 26th patient had a much better night; the intense headache had gone. He now progressed well until June 5th, when he had a rigor; temperature 103°. Calomel gr. 3, aspirin gr. 15, followed by quinine hydrochloride gr. 20, given. On June 6th temperature 102°, pulse 94. Complained of headache; vomited in afternoon; no pain in ear; no mastoid tenderness; slight pain and rigidity back of neck; very slight Kernig's sign present. Reflexes normal; no definite signs of intracranial complications.

On June 7th temperature 101·2°, pulse 90; headache intense; slight retraction of head; Kernig's sign definitely present; no aural pain. Lumbar puncture; a test-tube full of cerebro-spinal fluid under pressure and cloudy in appearance evacuated. Microscopical examination on the spot showed numerous pus cells. Subsequent report from pathologist showed Gram + staphylococci. Under general anæsthesia the antro-tympanic cavity was again reopened and thoroughly explored; no pus found. The brain substance of the middle fossa was explored with a needle; negative result. On June 8th and subsequent days patient was distinctly more comfortable. Headache and pain were absent, but he was drowsy; Kernig's sign persisted. The temperature gradually came down.

On the 12th there was a turn for the worse. Temperature rose to 103·6°; headache, pain in back and legs, was increasingly drowsy, and became slightly delirious. Another lumbar puncture; coconut-milk-like fluid withdrawn under pressure, containing far more pus cells than before. Subsequent report from pathologist showed Gram+ diplococcus present. Immediate improvement in all symptoms followed. The temperature remained in the region of 102° for three days and then came down. On July 1st he began to get up from his bed, and when evacuated to hospital ship on the 14th, could walk several hundred yards without fatigue. Kernig's sign was much less marked.

Cases of definite septic meningitis with pus in the cerebro-spinal fluid which recover must be very rare. I have never met one in my own practice. There are two suggestive points. The organisms found in the cerebro-spinal fluid were of low virulence, and the resisting power of the patient was much weakened by malaria. Had his powers of resistance not been weakened by malaria, it is more than likely that no suppurative lesion of the meninges would have occurred. From over three years' experience in Macedonia I have no hesitation in saying that complications of middle-ear suppuration are more common[1] than they would be in England under the same circumstances, and the reason for this is the deleterious effect of malaria on the resisting powers of the individual. Organisms of low virulence are thus able to bring about infections, but this very fact gives the patient a chance of ultimately overcoming them. Also noteworthy is the marked relief afforded by each lumbar puncture.

A CASE OF PERITONITIS FOLLOWING A NON-PENETRATING WOUND OF THE ABDOMINAL WALL.

BY A. E. CHISHOLM, F.R.C.S. EDIN.,

LATE CAPTAIN, R.A.M.C.

THAT peritonitis may result from a non-penetrating wound of the abdominal wall, with the abdominal viscera showing no gross lesion, seems proved by the following case.

Account of Case.

Gunner J. H., recently wounded, was admitted into hospital on Oct. 2nd, 1917; very collapsed and appeared to have lost much blood. Entrance wound, about ½ in. in diameter, in right buttock just external to posterior superior spine of ilium. Exit wound, about 1 in. across, in lateral sector of right iliac region. The patient was treated in the resuscitation ward for some time; no signs of improvement; it was decided to operate lest internal hæmorrhage was going on.

I opened up the anterior wound and found that the right lateral peritoneum was exposed in track of missile. Careful examination by Lieutenant Camps, who assisted, and myself, revealed no penetration of abdominal cavity. The right iliacus muscle was severely lacerated. Also fracture of the right iliac bone, involving separation of greater part of crest with part of body; comminution not very great. The damaged tissue was cut away, but not in region of exposed peritoneum, as it would have necessitated opening the abdomen. Bipp was rubbed gently, in a thin layer, into the raw surfaces. The muscles and skin were partly closed in layers, but greater part of wound was left open and very lightly packed with gauze. The entrance wound was then dealt with, the edges being excised and subjacent injured tissue clipped away; bipp was applied. Prior to operation a catheter was passed; small quantity of clear, rather concentrated urine was drawn off; urine not examined.

On the following day the patient seemed better; rather persistent vomiting. It is unnecessary to detail general treatment; various remedies, including alkaline treatment, were employed. On the morning of Oct. 4th patient was much worse. 1 c.cm. of pituitrin was given hypodermically and sodium bicarbonate and glucose solution intravenously. Death took place about midday. During all this time very little urine passed. There did not seem any very definite indication to open the abdomen, especially as one felt certain that the parietal peritoneum had not been punctured. The man would almost certainly have been unable to stand such a procedure.

Post mortem.—The following conditions were found. Peritonitis, apparently rather subacute, involving chiefly lower half of small intestine, pelvis, and region of cæcum. There were a good many plastic adhesions and patches of adherent lymph; small quantity of dark reddish semi-purulent fluid in pelvis. No *B. coli* infection smell. The stomach was not distended; tendency for intestines to be somewhat collapsed, except jejunum, but this was not actually distended. The bladder contained only a little fluid. The appendix was bound down over brim of pelvis by a recent soft plastic adhesion; otherwise appeared healthy. The parietal peritoneum in relation to the wound was very carefully examined; no perforation found. The small intestine was carefully examined from the duodeno-jejunal flexure downwards; no perforation; cæcum and ascending colon also appeared intact. The rest of the large intestine, not in relation to the wound, appeared whole. On opening the abdomen no free gas was detectable. The kidneys appeared rather cloudy. A swab from fluid in the pelvis was taken, but there had been already contamination, being taken on a second examination.

Inferences.

It would seem that the intraperitoneal infection must have taken place in one of three ways: 1. By direct spread of infection from the wound through damaged parietal peritoneum. No swab was taken from the wound, but on the day after operation it looked fairly clean. 2. By

[1] See also THE LANCET, 1918, i., 704.

escape of infection through a perforation in the bowel. But one has good reason that no such perforation existed. 3. By escape of infection through contused bowel. The absence of fæcal odour in the peritoneal exudate tends to negative this. The probability is, I think, that the infection spread through the peritoneum from the wound.

The treatment of such a case presents difficulties. If the abdomen had been opened at the operation nothing pathological would have been found. Later the indications for opening the abdomen did not seem sufficiently clear; also the patient's condition did not warrant this.

The point arises, Should the soiled peritoneum in such a case be freely clipped away in spite of this involving the formation of a communication between the wound and the abdominal cavity? This idea is carried out by some in the knee-joint. A French surgeon informed me that if he found the outer surface of the joint capsule so soiled that the soiled tissue could not be removed without opening the joint, he freely excised it, opening the joint and afterwards stitching up the hole. Should this principle be applied to similar circumstances where the abdomen is involved? The proceeding would seem risky, and yet possibly not more so than in the knee-joint. Of course, it would never do to remove a large piece of parietal peritoneum in the wound, as it would be impossible to close the opening.

Another Case.

Since completing these notes another somewhat similar case has passed through my hands.

Private W. R., wounded on Feb. 27th, 1918; operation some 12 hours later. Entrance wound on right iliac crest anteriorly. No exit wound. Severe fracturing of right ilium and a good deal of laceration of right iliacus muscle. Peritoneum exposed in track of missile, but not lacerated. Patient was greatly shocked and had apparently lost a good deal of blood. An alkaline intravenous injection was given before, and a pint of blood after, operation. This consisted in cleaning up the wound and clipping away as much damaged tissue as was deemed wise, considering the patient's poor state. The parietal peritoneum was left intact. The wound was bipped and left open. Post mortem: Peritonitis with signs of bruising of bowel, but no perforation detected either of bowel or of parietal peritoneum.

A CASE WITH COMPLETE CESSATION OF FITS RESEMBLING EPILEPSY.

BY H. DE C. WOODCOCK, M.D., F.R.C.P. EDIN., D.P.H., &C.

THE following case came to my notice years ago.

A little Jewish boy had his tonsils removed. He lost a considerable amount of blood, and within a week or two he appeared to be an epileptic—that is, he had epileptic fits. Dr. A. H. Clark, of Morley, saw him, and he was treated with bromides without the slightest benefit. Dr. Clark and I were working together at that time, and we saw the case together at the boy's home. The boy on this occasion was undressed in my presence. As the sister took off the stocking from his right leg the patient went into an epileptic fit of the classical type, beginning on one side of the body and travelling to the other; clonic convulsions following tonic, and unconsciousness being complete. Recovery was speedy. On a subsequent visit the same phenomena were repeated, and it was then that the sister said: "Whenever we undress him he has a fit." As the treatment was doing no good it was discontinued. Patient recovered completely. I saw him some years later, and if the statement of his friends is to be relied on, there had been no subsequent attacks. It appears that peripheral irritation had induced the epilepsy, and that peripheral irritation had continued to excite the attacks.

The Jews are pathologically peculiar. The boy was highly intelligent and sensitive, and the attacks may not have been true epilepsy; all I can say is that they could not be distinguished from true epilepsy. Dr. Clark and I, not feeling secure in a position of clinicists in nervous diseases, did not publish the case at the time, but I have often felt that I must deliver myself of the description of this, to me, extraordinary case.

Leeds.

NEW HOSPITAL FOR EAST HAM.—The East Ham Hospital, which at present consists of 25 beds, is to be enlarged as a war memorial at a cost of over £30,000. Sir Samuel Waring has promised a donation of £2000.

Medical Societies.

ROYAL INSTITUTE OF PUBLIC HEALTH:

LONDON CONFERENCE.

(*Concluded from p. 18.*)

III. HOUSING IN RELATION TO NATIONAL HEALTH.

IN the absence of Sir ASTON WEBB, the chair was occupied by Professor E. W. HOPE, medical officer of health for Liverpool. He said he was acquainted with the struggles to grapple with insanitary areas, which were the heritage of woe bequeathed by previous generations. The root trouble was the original vicious structural state of the houses. 22,000 tenements, many of the back-to-back character, and leading to blind alleys, were the monument of Liverpool's rapid prosperity, when the one object was to crowd as many houses to the acre as possible, and the task of finding homes for the dispossessed which followed on improvements was left to the present generation, and it had been well grappled with.[1] The three-years mortality rate among infants in the insanitary areas before they were dealt with was 259, but in the three years 1916 to 1918 it had dropped to 162, and the phthisis rate had been reduced from 4 to 1·9 in the same time. The general death-rate was 37 in the old, 26 in the new. The birth-rate had always been high, averaging 45 for the three years prior to demolition, and 40 in the 1916 to 1918 period—almost double that of the country as a whole. These figures were in regard to a population of 12,000. Drunkenness had decreased, and the condition of the children had definitely improved. The housing question was inseparably mixed up with the welfare of the race, and he hoped for a continuance of interest now evoked by the housing schemes, with which he hoped would be incorporated better and cheaper means of transport. The new houses for this prolific part of the population should include proper storage provision and appliances for domesticity.

The Architectural Aspect of Housing.

Professor S. D. ADSHEAD, F.R.I.B.A., dealt with the question from the architectural standpoint. He averred that the architectural aspect of housing seemed to have been largely lost sight of; it was an intangible quality, and might be termed the moral hygiene. He thought the new housing schemes should express the new organisations of society, as the old water-tight compartments of society were giving place to new conditions. There was need for standardisation of houses, but that did not mean mere repetition; the old days of 40 and 50 houses in a block of exactly the same construction were gone. There could be standardisation and yet such variations as reflected the social strata of the workers of the present day. Great variety could be produced by variants on only three plans, so that standardisation did not mean monotony. There had never been such an opportunity as the present for producing magnificent organised housing schemes, and he asked that the old-fashioned village should not be taken as the working model for the new, historically interesting though the former was.

The Citizen's Ideals.

Mr. NEVILLE CHAMBERLAIN, M.P., voiced the point of view of the citizen who was deeply impressed by the difference he saw in the best and the worst parts of a city, and whose earnest desire was to bring up the general average of health and comfort. He assumed that the citizen was willing to pay for his ideals; indeed, even economically, he would get back the expenditure on improvements by the diminished poor-law relief and other accompaniments of poverty and ill-health. The birth-rates of our cities were invariably highest in the economically worst parts, and schemes for betterment of those parts might lower the birth-rate; but that was counteracted by a lower death-rate too, and if the infants coming into the world had a better chance of surviving and living full and useful lives, the balance was certainly on the side of advantage. Large hopes had been raised by the mention of schemes which should transfer families from congested industrial districts to suburbs, but sufficient account had not been taken of three very important factors. First, it would take years

[1] THE LANCET, 1910, i., 1718; ii., 60.

to overcome the present house shortage, and until that was accomplished it was useless to talk of sweeping away the slums. In Birmingham there were 40,000 back-to-back houses. The second point was that large numbers of people did not wish to leave the slum localities, not because they were satisfied with their housing conditions, but they preferred improvement on the spot. Thirdly, a large number did not want to pay the rent which would be charged for new suburban houses. His point was that, even if all slum-dwellers wished to reside in suburbs, the provision for them would require years to bring about, and meantime every effort should be made to improve their present residences. Partial reconstruction would make an enormous difference, and this should not be left to private owners, some of whom, however willing, had not the necessary capital to carry out the needed structural alterations. Under Section 4 of the Housing Act of 1890 a local authority could pass a resolution that an area was unhealthy and that an improvement scheme should be carried out in respect of it, and in the new Housing and Town Planning Bill it was recognised that it ought to be possible to purchase lands in such area even before any improvement scheme had been formulated. The need was for a provision for compulsory purchase.

Primary Importance of Housing Schemes.

Mr. W. H. CADBURY said he agreed with those who said that every sovereign spent in the prevention of tuberculosis was of more value than £10 spent in sanatorium treatment and after-care schemes, and among preventive measures he considered that housing schemes came first, especially when due attention was given to through-and-through ventilation. Of 600 tuberculous soldiers who had been visited recently, 107 lived two families in one house. Preference should be given to soldiers who had fought in the war in letting the new houses. The birth-rate in Birmingham in 1865 was 39 per 1000; now—1918—it was 19·4, and it was still on the decline. Educated people seemed averse to bringing children into the world to face overcrowding, disease, and dirt. The Birmingham scheme was started with the stipulation that every house should have at least three bedrooms, but, yielding to pressure, a certain number of two-bedroomed houses had been arranged for.

Earth Closets for Rural Areas.

Sir RICHARD PAGET emphasised the importance of giving, in the new houses, the strictest scientific attention to the new needs of the community. He reminded the meeting that the main requirement in ventilation had been shown to be cool air in motion. The rural bungalow found great favour in his eyes, but with a cosy dressing-room, and this required a new design in cottage architecture. He also advocated a proper system of earth closets for rural areas and the use of the excreta on the garden. Sir William Crookes had estimated the loss of nitrogenous garden manure owing to the provision of water-closets at 14 million pounds per annum. He also advocated the use of labour-saving devices for the kitchen.

Resolutions Approved.

Mr. CHAMBERLAIN then moved the following resolution:—

This Conference is of opinion that while every effort should be made to provide the maximum number of houses on suburban sites, local authorities should be given further powers to enable them simultaneously to improve housing conditions in the central areas of large towns.

The further discussion revealed impatience at the delay in bringing the schemes about. The resolution was carried, 6 voting against. The following resolutions were also approved:—

(1) That the Conference is of opinion that the Housing and Town Planning Bill should include provision for the registration and more effective control of the subletting of dwelling houses, so that adequate provision may be made for proper washing, larder, laundry, and lavatory accommodation.

(2) That, notwithstanding the facilities already granted under the Orders of the Local Government Board in regard to the promotion of Housing and Town Planning Schemes, the Conference is of opinion that the Housing and Town Planning Bill now before Parliament should be passed into law without further delay.

(3) The Conference is of opinion that the erection of dwelling houses in the congested parts of cities and towns should be minimised, and that every facility should be provided to ensure their erection in open suburban areas, and that adequate, rapid, and cheap means of locomotion between the dwelling houses and places of occupation should be provided.

(4) That, in the view of this Conference, a wider and more liberal interpretation of the by-laws of many districts is necessary, and in others a more effective one, and that full discretionary power should be given to the Ministry of Health to authorise modifications to meet local conditions. It is also of opinion that the improvement of the conditions of rural housing is of not less urgency than is that of the cities.

(5) The Conference recommends that the research now being carried out by the Government with respect to building materials and other details may be extended so as to include organised research as to the most efficient methods of ventilation, heating, sanitary and labour-saving devices, and their application to small houses in both urban and rural districts.

IV. MATERNITY AND CHILD WELFARE.

Mrs. Lloyd George had been invited to preside at this session, but found herself unable to do so.

Sir FRANCIS CHAMPNEYS (Chairman of the Central Midwives Board) occupied the chair, and opened the debate with an address on

The Protection of Motherhood.

He spoke first of the effect on the child of venereal disease in the mother. The immediate period to give attention to was that of pregnancy, parturition, and lying-in. Systematic attention to the questions of pelvic abnormalities and pelvic toxæmia, with pre-parturition examination of the mother, had resulted in a great increase in national health. Among the affluent the responsibility rested with the medical practitioner, in the case of the poor generally it rested with the midwife. The Central Midwives Board, however, discouraged diagnoses by midwives, but required them to inquire as to previous pregnancies, and if in any way abnormal to advise the expectant mother to seek advice at a hospital or other suitable institution. Should untoward symptoms occur she must report them at once; failure to do so was a penal offence and she was liable to be struck off the Register. Since the first operation of the Midwives Act in 1902 there had been a distinct improvement in these matters, but it had not been materially advanced, and it was desirable to ascertain in whose hands fatal cases continued to occur. It was a pity that the request of the Board that the death certificate should have a space for the name of the person who delivered the child was not granted, as this would have been very helpful. More information was also wanted as to the manner in which sepsis still occurred. There was need for many more obstetric institutions, so distributed over the country that no parturient or lying-in woman should be beyond the reach of one of them, and motor ambulances should be available. In 1914 there were 879,096 live children born in England and Wales. Stillbirths before 28 weeks of pregnancy were not yet registrable. If the average stay of the mother in an institution were taken as 25 days, it was calculated that 35,164 beds would be required in England and Wales per annum. At the foundation of the safety of the nation's motherhood was the training of the midwife, but the energies of the machinery set up by the Midwives Board were largely diverted into training women who never intended to practise midwifery; a serious position now that there was none too much material to train on. In 1918, of 19,357 midwives trained at approved institutions other than Poor-law, only 4640 notified their intention to practise it, a wastage, from this special standpoint, of 294,340 cases; and, adding other training centres, a total wastage of 356,420 cases! He considered that candidates should be required to bind themselves to practise as midwives for a definite term of years.

The Protection of Infants and Children.

Lady LESLIE MACKENZIE (Edinburgh) spoke eloquently on the question of the protection of infancy, pointing out how badly off were the many parts of the country where no gynæcologist was available; the thoughts on this subject were apt to be focussed on the city and the big town. All possible care should be given to every mother for the purpose of ensuring that she reared a healthy child; and this was rendered the easier by the fact that the Notification of Births Act allowed every public health authority to make whatever arrangements it thought fit to attend to the health of expectant and nursing mothers, and children up to 5 years of age. The present rate of death below 3 months of age was a disgrace to any civilised country. She insisted very strongly on the need in the young child of personal nursing by its mother, and the conscientious training of health visitors as well as nurses in the due care of the infant.

Mr. A. CARLESS dealt with the subject of the protection of childhood, pointing his remarks by reference to the case of Dr. Barnardo's Homes, through the doors of which

87,000 children had now passed. The death-rate had been phenomenally small, varying between 7·26 and 11·70 per 1000. He paid special attention to the question of sufficient and efficient food and plenty of sleep and exercise.

Dr. C. J. MACALISTER (Liverpool) said that the number of children attending the out-patient departments of Liverpool was larger than they could deal with. He described a scheme by which that city was to undertake a clearing-house arrangement for sending sick children to the most suitable institution for their particular ailment. He hoped to see established a great school for the study of children's diseases, which would probably take up research in children's ailments.

Resolutions Approved.

The sitting ended with the passage of the following resolutions:—

1. That this Conference views with great satisfaction the results already obtained from efforts made to promote the welfare of motherhood and infancy, and welcomes the prospect of fuller appreciation of the services which can be rendered by properly trained midwives and health visitors.
2. That the Conference considers the proper distribution of midwives and health visitors should come within the purview of the Ministry of Health.

V. THE TUBERCULOSIS PROBLEM UNDER AFTER-WAR CONDITIONS.

The concluding topic of the Conference was the Tuberculosis Problem under After-war Conditions. The chair was occupied by Professor HOPE.

Mortality from Tuberculosis in England and Wales.

Dr. H. HYSLOP THOMSON (tuberculosis officer for Herts) said that in 1911 there were in England and Wales 53,120 deaths from all forms of tuberculosis. In 1914 these had fallen to 50,298, but rose again in 1918 to 58,073, an increase common to both fighting forces and civilians, with a notable rise among asylum inmates, in one large asylum the 2 per cent. of 1914 rising to 11·7 per cent. last year. The increased mortality he attributed to the depleted resisting power of the population due to a prolonged war. One of the weakest links in systems for combating tuberculosis was the present method of notification, which included no information as to the danger of infection and the home conditions of the patient, and it placed no initial responsibility on the general practitioner. He considered that the services of the general practitioner needed to be extended in regard to the notification and prevention of disease. Dr. Thomson proceeded to discuss the various methods of prevention and treatment in detail. There should be segregation of acute cases, and adequate treatment of the advanced ones; he recommended their compulsory removal to a proper place. Much of the criticism of sanatoriums was due to the fact that too much was expected of them alone, though he admitted that the standard of such treatment throughout the country left much to be desired, both as to uniformity and efficiency. Sanatorium treatment could not be standardised, but certain general principles could be universally adopted. There was no other system which arrested the progress of the disease so well. No patient should be discharged from a sanatorium in whom there was further possibility of improvement. He dilated on the very poor provision for non-pulmonary cases of the disease, and entered into the question of domiciliary treatment, for which there was need of systematised effort on a large scale. His concluding remarks dealt with after-care.

The Disease and its Treatment in Service Men.

Dr. NATHAN RAW, M.P., spoke of the disease and its treatment among combatants. We must, he said, pay the highest tribute to the brave men who had fought for us and had developed tuberculosis. A large number of ex-service patients must have had the germs of the disease before the war, but the rigors and severities of trench warfare, and the great privations which soldiers had to endure were agents in stirring into activity what had hitherto been quiescent disease. He spoke of the desire of the Government to do everything possible for these men, and referred to the Commission which had been appointed to deal with the matter, of which he himself was a member. The number of Service men afflicted with tuberculosis was between 35,000 and 40,000, but a fair proportion were in the early curable stages, and many others were in a stage which permitted of their useful employment. He promised that the provision for the ex-service men would be adequate, and he hoped the report of the Commission would soon be issued. A fact to be reckoned with was that a large number of the victims of the disease refused to enter a sanatorium, and he asked that every effort should be made to counteract the prevalent notion that tuberculosis, in any stage, was an incurable disease.

Tuberculosis Communities.

Dr. NOEL D. BARDSWELL (medical adviser to the London Insurance Committee) dealt with the question of tuberculosis communities. He said that unless the work of the various institutions could be associated with after-care, their work often fell to the ground. The factors which rendered ineffective the work of sanatoriums included the habits of the people, and economic questions, such as a living wage and housing accommodation. The root idea behind the tuberculosis settlement was the voluntary segregation of tuberculous persons in a community, which would allow of a more effective supervision than could be exercised at present. This, in order to be efficient, must be made attractive. Another important principle was the protection of the partially disabled worker from having to compete for his livelihood against physically sound men and women. These patients could not be dealt with to the exclusion of their families; hence the obvious need was for small village communities or something in the nature of garden cities. The prime object should be, not to give these patients seven or eight weeks of sanatorium treatment, but an opportunity of working under favourable conditions for the rest of their life. He believed the ordinary industrial occupations would prove more suitable in the long run than agricultural pursuits, and the opening was more extensive.[2] The case of the soldier presented a good opportunity to put the community system to the test; the soldier had his pension, and would be found very willing to take up some work. And what was found practicable for the discharged soldier could be applied to the case of the civilian.

Mr. H. J. GAUVAIN put in a plea for the non-pulmonary cases, for which nothing in an organised way had yet been done in this country. One or two large centres would probably suffice for all the cases of surgical tuberculosis in the country.

The Necessity for Accurate Diagnosis.

Lieutenant-Colonel W. MALLOCK HART referred to the disease as it affected the Canadian forces in the war, and pointed out the great importance of an accurate diagnosis. As director of the hospital for tuberculosis for Canadians here he could speak of its work. It had acted largely as a clearing centre, because many cases were sent back to Canada as soon as the disease was diagnosed. He felt in increasing degree the need for educating the general public with regard to tuberculosis; he had had experience in America with the results in educated communities and those in people who were ignorant on these matters. He did not consider that tuberculosis had increased as a result of men being on active service; indeed, he believed that the open-air life of the Army had preserved the health of many men who otherwise would have broken down. Of 900 cases he saw, 28 per cent. were in the incipient stage, 42 per cent. in a moderately advanced stage, 30 per cent. in an advanced condition.

The Need for Combative Measures in Ireland.

The Marchioness of ABERDEEN spoke on the question as it affects Ireland, pointing out the crying need of combative and remedial measures in the rural parts of the country. The educative campaign against tuberculosis which took place in Ireland a few years ago showed how quick were the Irish people to adopt the ordinary precautions, such as the open window. But the conference recently held in that country under the auspices of the Women's National Health Association showed that there was scarcely any provision for advanced cases of the disease; that conference unanimously urged the putting into force of compulsory notification of the disease. She concluded with a special and moving word on behalf of the Irish children.

Return to Family Life a Factor in the Eradication of the Disease.

Professor Sir G. SIMS WOODHEAD said he believed it was possible to stamp out tuberculosis; but there would be

[2] THE LANCET, 1919, i., 456.

but little chance of eradicating it unless the man who had been away could be brought back to his family life. It was not always the most robust person who was the most resistant to tubercle; and he urged that no one measure—such as open windows or good food—was sufficient; all means must be employed, and the machinery must not be allowed to hide the work.

The subsequent speakers included Dr. NASH, Dr. S. VERE PEARSON, Mr. DAG, Mrs. PALMER, Dr. SUTHERLAND, Dr. CECIL WALL, Mrs. SANDHALL, and Mr. BURNS.

Resolutions Approved.

The following resolutions were then put and approved:—

1. That in the opinion of this Conference schemes for the prevention of tuberculosis must be of general application, and it recognises that sanatoria, colonies, and other establishments for treatment and segregation are of the utmost value in the prevention of tuberculosis.
2. That the Conference recognises the obligation to provide not only for the tuberculous soldier, but for the tuberculous wife or child of the soldier or civilian or for any other member of the population.
3. That this Conference recognises the necessity for adequate provision being made for the treatment and training of sufferers from non-pulmonary tuberculosis, more especially in the case of adult sufferers, for whom no provision has hitherto been available.
4. That in the preparation of designs for the new houses which are to be erected in the near future special regard should be taken to the provision of the best methods of ventilating, heating, and sleeping accommodation, and a rigorous enforcement of by-laws designed to protect the dwellings from damp, with the object of combating and preventing tuberculosis by improving the general health of the community.

The Conference, which was carried on with much enthusiasm throughout and was very successful, concluded with the usual votes of thanks.

ROYAL SOCIETY OF MEDICINE.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

A MEETING of this section was held on June 20th, Dr. J. PORTER PARKINSON, the President, being in the chair.

Dr. HAZEL CHODAK showed a case of

Chorea, Complicated by Gangrene of the Fingers.

The patient, aged 12 years, was admitted to hospital in December, 1918, suffering from chorea of a week's duration. This was a first attack, and there was no previous history of rheumatism; no history of shock or overwork. Two years previously she had had diphtheria, with a bad attack of tonsillitis during convalescence. The mother had had rheumatism and one sister had had chorea. On admission the patient, a thin girl, was found to be suffering from a moderately severe attack of chorea, all parts of the body being affected. There was very little loss of strength on the left side, but the right-hand grip was poor and feebly sustained. All reflexes were exaggerated. On examination of the heart the apex beat was found in the fourth space, half an inch inside the nipple line; a soft blowing murmur accompanied the first sound at the apex, and was conducted a short way towards the axilla; the second sound was accentuated at the base.

Ten days after admission the right hand began to go white and the finger-nails blue, though the hand did not actually feel cold to the touch. The onset might be described as rapid rather than sudden, and it was fully a week before gangrene of the finger-tips and ball of the thumb had definitely set in. During this time the pallor spread up the forearm. There was no pulse at the wrist, but the brachial artery could be felt pulsating about half-way down the upper arm, and after a time there was distinct pulsation of the superior profunda artery. The pain, which was also gradual in onset, became very severe after the first few days, and could only be relieved by morphia. Meanwhile the cardiac signs showed changes in degree rather than in kind. The systolic murmur became much louder and rougher, while the second sound at the aortic and pulmonary areas was markedly accentuated. At first the apex beat remained within the nipple line, but in a few days it was found to be displaced slightly outside the nipple line. The pulse, however, remained at about 80, and was never increased in frequency, except occasionally when the pain had been very severe. The temperature throughout never rose above 99° F., and was rarely as high as that. Later still, the brachial pulse slowly disappeared, and the brachial artery could be felt like a thick cord along the arm. The little finger recovered, and lines of demarcation gradually formed on the remaining fingers. The ball of the thumb appeared at first to have escaped, as the discoloured skin peeled away from it, but there must have been considerable damage to the muscle, followed by contraction of the scar tissue, which had led to considerable deformity of the thumb. The choreic movements subsided rapidly soon after gangrene was established. The heart signs also disappeared, but much more gradually.

The question of interest in this case was the exact cause of the gangrene. The three possible causes of gangrene complicating chorea were: (1) Embolus; (2) arteritis (leading to thrombosis); and (3) arterial spasm (resembling Raynaud's disease). Raynaud's disease was mentioned as an infrequent complication of acute rheumatism, and might lead to local gangrene, but in this case there was extensive thrombosis which could hardly have been caused by mere spasm. As between embolus and thrombosis, the diagnosis was not easy. Dr. Chodak did not think that the absence of abrupt onset negatived the embolism theory, as conceivably the artery might be only partially blocked at first. It was difficult, however, to feel convinced that there was ever any gross organic lesion of the heart, as the pulse and temperature kept so steady. At the time, however, the slight dilatation, the character of the murmur, and the loud accentuation of the second sound, made one believe that this was the beginning of a rheumatic carditis. There remained the supposition that there was a primary thrombosis in the brachial artery. Arteritis was not an infrequent complication of acute rheumatism, and although this was generally located in the aorta, there seemed no reason to suppose that the brachial artery might not be affected also. Such a condition might be speedily followed by thrombosis. In these cases the circulation was usually kept up by anastomosing channels, so that gangrene did not often occur. Probably in this child the general condition of debility and anæmia was a predisposing cause.

Dr. F. S. LANGMEAD showed a case of

Sclerodermia with Calcification in a Mongol.

The patient, a boy, aged 4½ years, was the last child of a family of three. The mother was aged 42 years at the child's birth. The other children were aged 17 and 15 years, ten years elapsing between the last gestation and the birth of the patient. The mother said that she had always been healthy except that she had been anæmic. During pregnancy she felt quite well. The father and his family were described as highly strung and nervous. There appeared to be no neuropathic tendency in the mother. No alcoholic history.

The boy was small and appeared healthy at birth, but the mother noticed a similar discolouration and rash to that which was now visible on the knees, face, and hands. She was sure that the rash had always been present, but had varied in intensity from time to time. He had always been backward, sitting up at 10 months, walking at 1 year and 10 months. Walking had never been properly acquired, but had been feeble, with the legs apart. Until the last few weeks he had ceased walking altogether for two and a half years, and became unable to stand. In October or November, 1917, he was admitted to a hospital for "blueness" over the fronts of the upper arms; this had begun to spread to the chest over the pectoral muscles, but apparently improved considerably before his discharge. In December, 1917, he developed pneumonia, but made a good recovery. In June, 1918, lumps began to appear on the surface. At first they were quite soft and limited to the area over the biceps, but about two months later began to harden. More recently they had been noticed to spread inwards over the pectoral region. Flushing of the face varied greatly. It had been noticed for about two years, and was more marked on warm days. The legs had been noticed to be getting thinner for about six months, and about two months ago stiffness of knees and ankles supervened.

The child was a moderately marked example of the Mongolian variety of amentia, but with mental capacity above the average in such cases. The cheeks had a dusky-red, patchy appearance, the skin being somewhat atrophic and shiny. A similar blotchy bluish-red discolouration was seen on the fingers and hands as far as the wrists. The fingers were shiny and small, but no definite sclerodactylia had developed. The skin on the knees, extending upwards on the outer aspects of the thighs, and on the buttocks in the neighbourhood of the ischial tuberosities, was similarly affected. On the arms the discolouration had disappeared, and was replaced by white, firm, contracted skin, thrown into unevenness and puckers by subcutaneous nodules of sizes varying from minute seed-like bodies to plaques larger than a shilling. Some of these were confluent, others discrete. They were roughly linear in distribution and symmetrical, though rather more extensive on the left side than on the right. This condition had spread inwards over the pectorals, and backwards over the triceps on each side. On the left it reached somewhat farther down beyond the elbow and over the extensor carpi ulnaris muscle. A similar alteration of skin and subcutaneous tissue appeared in a roughly symmetrical manner in other areas, notably on thighs, legs, and in popliteal spaces. Some of the subcutaneous thickened areas were adherent to the skin, others were not. Some of the nodules were very hard, feeling

almost like bone. Here and there a nodule had caused redness and soreness of the overlying skin and slight scab formation. X rays demonstrated that the subcutaneous tissue in the nodular and thickened areas was sprinkled with small pleomorphic calcareous deposits. The muscle did not seem to be affected, but it was questionable whether they were not being gradually infiltrated from the subcutaneous layer. The movements were limited by the inelasticity and fixation of the skin. In addition there was some limitation of movement of the knees and ankles disproportionate to the subcutaneous hardening, probably due to accompanying synovial changes.

The points of interest were (1) the discolouration of the skin dating from birth, and later being replaced by sclerodermia; (2) the calcification of the sclerodermatous subcutaneous tissue (calcinosis, petrifaction)[1]; (3) the associated arthritic changes; and with respect to the Mongolism, (4) the long period of sterility before the child was born.

Mr. PAUL BERNARD ROTH described a case of

Apophysitis of Os Calcis.

The patient was a boy, aged 14 years, who was said to have suffered for some years with double flat-foot. For ten years or longer he had had trouble with his feet, and for the last two years had had pains in his feet and ankles up to his calves on running. When seen by Mr. Roth he could only just walk from his house to the schoolhouse (ten minutes' walk). He had had various arch supports and appliances, such as thickenings of the soles and heels of his boots, electric baths and massage, but the pain still continued. On examination there was found to be a slight tendency to talipes valgus when he walked; all the pain was at the back of the heel and up the tendo Achillis; there were tender spots on both sides of the insertion of this tendon. He considered the case to be one of inflammation from trauma of the posterior epiphysis of os calcis.

Radiograms showed a cartilaginous gap with irregular ossification between the upper part of the epiphysis and the os calcis, especially marked in the left—the worse—foot, and some rarefaction of the bone at this point. As these radiograms confirmed the diagnosis, treatment by prolonged rest in bed was suggested, to be followed by gradually increasing spells of walking in boots with a rubber disk fixed to each heel, a pad of sponge rubber beneath each heel inside the boot, and a ¼ in. valgus wedge of leather applied to the inner side of each sole and heel. Complete rest in bed for six weeks was followed by some pain, evidently due to stiffness and muscular weakness from his long rest. A month later he was able to walk, and even to run a few steps without pain. Radiograms showed that the wide cartilaginous band with irregular ossification had given place to sound bony tissue through its entire length, except a very small portion at the top (most marked in left foot) where the junction of the epiphysis was not quite complete.

Dr. EDMUND CAUTLEY showed a case of

(?) *Chloroma.*

The child had been first admitted to hospital for screaming and cerebral irritability, and was found to be feverish and apathetic, with right facial palsy and left-sided torticollis. These symptoms were rapidly recovered from, but after discharge a profound anæmia developed, bulging occurred in the temporal region, and the left kidney became palpable. Then pain was complained of in a hip-joint. The child became rapidly worse, and a month later nodules appeared on the head. The spleen and liver were enlarged and considerable increase in size of lymphatic glands was noticed. The red blood cells were 1,690,000; Hb, 25·5 per cent.; colour index, 0·79; leucocytes increased from 8000 to 14,000. Of these, the polymorphs increased from 1940 to 5845, the lymphocytes from 5660 to 7140. There were many features of chloroma, including a faint greenish tinting of the skin. The other possible diagnosis was adrenal tumour with secondary neoplasms in bone. In favour of this was the palpable left kidney which was noticed in the earlier stages. Skiagrams showed rarefaction of femora, vertex, and occipital region.

Multiple Glandular Swellings.

Dr. CAUTLEY also showed a case of Multiple Glandular Swellings in a child aged 1 year and 9 months. There was no family history of tubercle. The patient had been ailing since Christmas with diarrhœa, anorexia, and malaise. Enlarged glands were found in the abdomen. Others, large and freely movable, were present in the neck and axillæ, especially in the right. Red corpuscles numbered 6,000,000; white 4800. A differential count was not abnormal. The Wassermann reaction was negative. The diagnosis lay between tuberculosis and lymphadenoma, and Dr. Cautley favoured the latter.

Dr. E. A. COCKAYNE showed a case of

Trophœdema of Leg.

The patient was a boy aged 8½ years. There was no history of any similar condition in the family. The boy was normal at birth. At 1½ years there was a swelling, rather soft and lobulated, on the right side in Scarpa's triangle. Three months later some swelling of the right leg below the knee was noticed, and had increased ever since. When exhibited there was swelling of the whole of the right leg below the gluteal fold. The thigh was soft and the swelling in Scarpa's triangle could no longer be felt; it was 1 in. greater in circumference than the left. The lower part of the leg and dorsum of foot were very much swollen; circumference of right calf 13½ in., left calf 9½ in. The leg sometimes pitted on pressure. There was no nævus and no cyanosis. The texture of the skin was normal. X rays showed no difference in the size of the bones. There was no lengthening of the right leg. The right side of the face was a little longer than the left and the right palpebral fissure was wider. The condition caused the child very little inconvenience.

Dr. ERIC PRITCHARD showed specimens from a case of

Purpura.

The patient was aged 1 year and 2 months, and had been fed on milk; no fruit juice had been given. The father, mother, and another child were healthy. The child had had pneumonia in December, 1918, a burn on the neck three weeks ago, and for the past week had had an ulcerated mouth. On May 11th a bruise on the left leg was noticed, which increased in size so rapidly that the patient was admitted to hospital on the following day. On admission the temperature was 99·4° F. The child was well nourished but extremely pale. There were large blue areas over the left leg (6 in. by 8½ in.) and thigh (2¾ in. by 3½ in.), a patch on the right leg (3 in. by 3½ in.), and petechial hæmorrhages over both. Enlarged glands were present on the left side of the neck, and discrete glands on the right side. Nothing abnormal was detected in the lungs. The heart was normal. The gums were firm and there was no ulceration; the teeth were very discoloured; the liver extended 1 in. below the costal margin. On June 12th the scrotum was very œdematous. A purple patch was present over the left foot. The child died on the following day.

Post-mortem examination.—There was an unhealed ulcer on the left side of the neck, due to a burn, consisting of two areas of about ½ in. diameter each, joined together. There was a subcutaneous hæmorrhage about ¾ in. across on the chin, another area of about the same size on the right side of the neck, and large subcutaneous dark purple hæmorrhages on both legs. On the right side one hæmorrhage was about 2 in. in diameter over the patella, another large one was situated on the inner side and back of the middle of the leg, and all but joined a third one on the front and outer side, just above the ankle. On the left side the lower part of the leg was encircled by a hæmorrhage measuring about 4 in. from above downwards, and the epidermis above it was raised as a bulla. Both kidneys with their perirenal fat were the seat of extensive hæmorrhages, which were almost entirely cortical. Both testes were dark red from hæmorrhage. The only other hæmorrhage was in the middle portion of the thyroid gland. The thymus was a well-marked bi-lobed structure of ivory-white colour. The prepuce was œdematous, the liver pale, and the spleen slightly enlarged. The heart, lungs, pericardium, stomach, intestines, pancreas, and adrenals were all healthy.

Dr. LANGMEAD said that the appearance of the kidneys was exactly that of acute lymphatic leukæmia, and suggested that sections should be examined microscopically.

Dr. PRITCHARD also showed a specimen of

Liver Abscess with Septic Umbilical Vein.

The patient, a female, was aged 5 weeks and a full-term, breast-fed child. The father, mother, and four children were healthy. Vomiting always occurred at various intervals after the feeds, the vomitus being small in amount. The bowels were acting normally. On May 29th the vomiting became more frequent and larger in amount, and was of

[1] Vide F. Parkes Weber, Brit. Jour. Child. Dis., x., p. 97, at the end of which article references are given

a greenish-yellow colour. The bowels were constipated. The child was admitted on May 30th looking very ill, though fairly well nourished. The temperature was 101° F., the pulse 132, and the respiration 42 per minute. The vomitus consisted of bright green material, the abdomen was distended and soft, there was no visible peristalsis or visible tumour, and the liver and spleen were not palpable. The heart and lungs were normal. On May 31st the stomach wash-out two and three-quarter hours after feed contained 1 oz. of green slimy fluid and an abnormal amount of acid. Rectal lavage gave clear fluid, not offensive. On June 1st a turpentine enema resulted in a slight yellow stool; another yellow stool, large in amount and undigested, contained a very slight trace of mucus. On June 2nd the temperature was 102° F., and the child was vomiting its broth and water. A small green stool was passed after a turpentine enema, which did not lessen the distension. Subcutaneous saline was given, but the child died.

Post-mortem examination showed the abdomen to be distended. The peritoneal cavity contained 6 oz. or 8 oz. of yellow fluid, and the intestines were loosely matted together by plastic lymph. The umbilicus had healed. When the liver was cut into, the part of the vein within the liver was found to be greatly enlarged and to have thick walls, so that it measured about ½ in. in diameter. The lumen, however, was almost obliterated, but some greenish pus exuded from it, in which Gram-negative bacilli were found. All the organs in the thorax were healthy, as were also the kidneys, stomach, and intestines. The hepatic flexure of the large intestine was situated, however, beneath the neck of the gall-bladder, the ascending colon lay close along the right side of the spinal column, the cæcum was situated over the right ilio-sacral articulation, and the appendix lay across the fifth lumbar vertebra. The spleen was rather firmer in consistence than usual. The adrenals were rather large and the right one was of reddish hue.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A MEETING of this section was held on July 3rd, Mr. J. D. MALCOLM, the President, being in the chair.

In the absence of Mr. W. GILLIATT, his paper on

A Case of Obstruction to Labour due to Ventrofixation

was read by Dr. COMYNS BERKELEY.

The patient, a primigravida, aged 32, was admitted to Queen Charlotte's Hospital; she had been in labour five days and had had two attacks of uterine hæmorrhage. Examination showed a median sub-umbilical scar about 3½ inches long. The uterus was tense and asymmetrical, and the fœtal heart was not heard. The cervix was displaced upwards, backwards, and to the right, and the uterus seemed to be in early tonic contraction. Cæsarean section was decided on as the best method of procedure, as on examination under anæsthesia the inaccessibility of the cervix, its size and rigidity excluded vaginal methods.

On operation, the uterus was found fixed to the anterior abdominal wall by a thick tightly stretched band about 2 in. long which was attached to the posterior surface of the uterus 1 to 1½ in. behind a line joining the uterine ends of the Fallopian tubes. There was marked axial rotation of the uterus through almost a quarter of a circle, so that the right-sided bulging mentioned above was at the expense of the posterior wall of the uterus. A stillborn child lay in a cavity formed mainly by the posterior wall of the uterus, which was stretched very thin. The head was delivered with difficulty from a sacculation in the uterine wall, in which it was tightly gripped. The patient recovered from the operation, but died some days later from septic endocarditis. The nature of the previous operation was unknown on admission, but was afterwards discovered to be an amputation of the cervix uteri and ventrofixation.

In the course of the discussion on Mr. Gilliatt's paper, Dr. LAPTHORNE SMITH commented on the fact that the ventrofixation had been performed by attaching the posterior wall of the uterus to the anterior abdominal wall, and for this reason probably caused the obstruction. His practice was to make the attachment from the front wall, and below the line of insertion of the tubes.—Dr. BERKELEY concurred with this view, and the PRESIDENT suggested that, as a rule, ventrofixation should not be done in patients likely to become pregnant.

Demonstration.

Dr. EARDLEY HOLLAND gave a demonstration on the effects of excessive cranial stress in the fœtus during labour, and on the mode of origin of tears of the tentorium cerebelli and cerebral hæmorrhage.

TUBERCULOSIS SOCIETY.

The Annual Meeting.

AT the annual meeting and dinner held on June 28th, Dr. HALLIDAY SUTHERLAND, the retiring President, outlined the origin of the society, whose members now numbered nearly 200. Membership was open to all interested in tuberculosis work, and with the signing of peace it was hoped that the society would occupy a place of importance in guiding and advising the coming developments of tuberculosis work.

Dr. F. N. KAY MENZIES said that five years ago, when the London County Council undertook to provide treatment for tuberculous persons, there were only a few beds and one or two dispensaries available. Now there were 900 beds, shortly to be increased to 1000, and every area in the county was served by a dispensary. The difficulties hitherto existing between the Council and the Insurance Committee would soon be overcome, and he looked forward to the union of his work with that of Dr. Noel Bardswell, the medical adviser of that body.

Captain W. E. ELLIOT, M.P., said that the representation of medicine in Parliament looked to the society for guidance as to the united opinion of tuberculosis workers. He foresaw developments in the treatment at industrial colonies, and referred to the Hairmyres Colony in Lanarkshire. More thought should be given to the mental capacity of tuberculous men who might be used in the development of electric force and similar enterprises.

Tuberculosis Work: Hopeful Outlook.

Dr. NATHAN RAW, M.P., said that now the strain of war was over there was a very hopeful future to look forward to in tuberculosis work. The problem had been increased enormously by the return of thousands of tuberculous discharged service men, whom it was the country's duty to look after.

Dr. NOEL BARDSWELL hoped that the society would encourage expression of opinion from the junior branches of tuberculosis work. Their present remuneration was inadequate, and he thought that better prospects should be offered to them.

A Social Problem.

Dr. H. DE CARLE WOODCOCK, President-elect, said that the tuberculosis problem was a social as well as a clinical one and demanded administrative ability on the part of the tuberculosis officer. His present position as assistant to the medical officer of health required readjustment. The tuberculosis officer should be in control of his own district and responsible directly to his public health committee. Referring to the new housing schemes, he thought that it would be the gravest mistake to build new houses and then to allow advanced cases to carry infection into them. Legislation was needed to remove infective cases from overcrowded areas.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—A meeting was held on July 1st, at 11, Chandos street, Lady Barrett, M.D., the President, being in the chair.—Dr. Octavia Lewin read a paper on Nasal Hygiene and National Health, and showed several cases of children successfully treated for nasal obstruction and deafness without operation. She also showed a case of stenosis of the posterior nares following an operation for adenoids in a child who was a diphtheria carrier. Dr. Lewin emphasised the fact that many operations would be avoided by proper attention to the nose and breathing.—Dr. Eleanor Lowry read a paper on the Nose in Relation to General Diseases. She referred to the importance of nasal obstruction and sinus suppuration in respiratory, digestive, and nervous diseases, and gave instances of mistakes in diagnosis and treatment of such cases. She mentioned some of the superstitions held by patients as to the connexion between gynæcological conditions and the nose and throat, and said that it was to be regretted that similar statements were still made in text-books on gynæcology, and apparently copied into papers and books on the nose and throat.

THE LEAGUE OF MERCY.—Sir Frederick Green, K.B.E., honorary treasurer of the League of Mercy, has presented £10,000 to the League "in the hope that now that His Royal Highness the Prince of Wales has consented to become Grand President a new era of activity of the League may be inaugurated."

Reviews and Notices of Books.

A Text-book of Physiology. By MARTIN FLACK, C.B.E., M.B., B.Ch. Oxon.; and LEONARD HILL, M.B., F.R.S. London: Edward Arnold. 1919. Pp. 800. 25*s.*

WE offer a very hearty welcome to the latest addition to the list of text-books of physiology. There is a vigour, originality, freshness, and attractive method in the exposition of certain parts of the subject such as one rarely finds in a text-book. The fundamental facts and theories are set forth in an easily understandable form with many an apt comparison and illustration. Although primarily written to meet the requirements of the medical student, it cannot fail to prove of value to the general practitioner. In the not very remote future "applied physiology" will come to be an integral part of medical education, and the authors have kept this end in view. Only a few of the great names and epochal dates in physiological discovery have found a place in the text. By abbreviating their work in this way the authors have, it is true, followed the example of Michael Foster, though we hardly agree with their decision. The student should know at least the century of Galen, Harvey, Galvani, Charles Bell, Bernard, Waller, and Helmholtz. There is nothing in the text to indicate whether certain important discoveries were made during this century or two centuries ago. We are unable to find an allusion to Bell's law. If it is in the text, it is not in the index. This may be the case, for the index is not complete.

The subject-matter is divided into 13 books—of unequal scientific and literary value—each of which is composed of several chapters. About 70 pages are given to General Physiology, while about 180 are devoted to Blood and the Circulation of Body Fluids. The description of Immunity and Allied Phenomena is terse and practical, and leads up to the students' later studies in these subjects. Book III., on the Circulation of the Body Fluids, is comprehensive and well thought out. The newer work on Cardiac Physiology is more successfully dealt with than in any text-book with which we are acquainted. The student ought to be familiar with the main facts of electrocardiology, and these are admirably set forth. One chapter is given to Effect of Change of Posture on the Circulation, a subject of particular clinical interest, and one which has not been treated adequately in the past. The Circulation in Special Parts is also excellent. Respiration occupies about 60 pages—not too much, considering the importance of the subject. We are glad to see that Dr. Hill's fundamental work is incorporated, as well as illustrated by several useful diagrams. The chapter on Principles of Ventilation is pithy and practical, and well worth perusal and study. We regard the chapters on Respiration as the most finished and the best in the whole book, or perhaps in any modern text-book.

Books V. and VI. (pp. 325–406) deal with General Metabolism and Dietetics, and the Processes of Digestion, and VII. with Special Metabolisms—e.g., proteins, carbohydrates, fat, nucleins. The spleen is very cursorily dismissed. These "books" have not the same merit as some of the others. There is evidence of imperfect revision, either on the authors' or proof-reader's part Some of the rather vaguely described chemical processes might well be omitted. We are told that "appetite juice" "may be provoked by seeing, hearing, by smelling food"; "the injection of gastric mucous membrane of guinea-pig into rabbit may cause a specific cytolysin to form in the rabbit's serum"; and that gastric juice "is a clean watery liquid." "Meconium, the dark-greenish fæces passed by the newly-born child, are similarly acid in reaction, and inoffensive." Meconium does not find a place in the index.

The Functions of the Kidney, Skin, and Body Temperature form the next sections, and of these three the last is by far the best; indeed, it stands out as an excellent and practical exposition of the subject. We should like to have heard more of Cushny's recent work on the kidney. To the ductless glands (X.) only about 20 pages are given, illustrated by some good figures in the text; but even granting the controversial nature of much that is written about these glands and internal secretions, the subjects surely merit a more detailed survey. For the Tissues of Motion (XI.), including Animal Electricity, 40 pages suffice. Galvani's period is not given, and the omission of the name of Du Bois-Reymond should make, to use the old tag, that philosopher turn in his grave. The Nervous System (XII.) occupies 185 pages, and of these less than six suffice for the "autonomic system," including several large illustrations. By omission of some details throughout the text space would easily be found for a fuller treatment of the central and sympathetic nervous systems, and perhaps also of the cranial nerves and sense organs. A curious slip occurs on p. 630—four of the ocular muscles arise "from the back of the eyeball." Several chapters on Growth and Reproduction (XIII.), which bring the book itself to a close, constitute an excellent suggestive epitome. Throughout the book histology is only introduced to elucidate definition.

We hope that in the second edition we shall find that the index has been revised and minor errors eliminated from the text. Perhaps the authors will change their minds, too, about the use of "drachms" as a fluid measure. Meanwhile, we think that this text-book of Flack and Hill—both experienced teachers and distinguished investigators—will prove most acceptable to medical students, and more especially to those who are preparing for the higher qualifications, not only on account of the marshalling of the main facts, but because the subject-matter is set forth in a readable and pleasant form, while its applications in practical medicine are steadily kept in view.

Medical Annual for 1919. Bristol: John Wright and Sons, Ltd. Pp. 675. £1 net.

THE editor is to be congratulated on the success he has achieved in the production, under difficult conditions, of this valuable record of medical progress. Some of the authors appear to have felt themselves cramped in their expositions of new work. This is inevitable where so much research has been carried out in certain special departments and where so many of the conclusions are still in a controversial stage. The discussion on war neuroses, for example, is obviously not a complete summary of the results obtained by different observers during the war. A good bibliography at the end of most of the important articles serves to correct this inequality, while providing useful assistance to those who wish to pursue a particular subject further. The articles on blood transfusion and amputations are adequate and well depicted. The illustrations in general, including five coloured plates, are clearly printed on good paper. The title-page of the book would be easier to find if the advertisements which precede it were removed or printed on coloured paper. The volume is, as usual, securely bound and of a reasonable size.

Military Physical Orthopædics. Part I.: *Gunshot Wounds of Nerves.* By ARTHUR STANLEY HERBERT, M.D., B.S. Lond., Lieutenant-Colonel (Temporary), N.Z.M.C., P.M.O. of the Rotorua Orthopædic Hospital, Government Balneologist. With 62 illustrations and 12 figures in appendices. Wellington: By Authority: Marcus F. Marks, Government Printer. 1918. Pp. 136. 6*s.*

THIS is a valuable little book. It represents the results of the experience of a surgeon who, being placed in charge of a large number of cases of nerve injury caused by war trauma, worked out his own methods of treating them remote from the great centres of military orthopædics. It would have been still more valuable two years ago, but difficulties in printing prevented its appearance. The cessation of hostilities, however, will not affect the permanent value of the work.

Colonel Herbert seems to have been wonderfully successful in treating the disabilities following nerve injuries by means of very simple and cheap appliances, and particularly in his adaptation of the old principles of elastic traction to suit modern needs. Artificial muscles have a two-fold use. Firstly, by supplying a means of movement and preventing or correcting deformities, and secondly, by preventing stretching of paralysed or weakened muscles and thus helping them to regain function.

The importance of antagonist muscles is now well recognised, and by supplying artificial antagonists, elastic traction is of great value. In particular is the author's "long quadriceps strap," a very valuable addition to the

armamentarium of the orthopædic surgeon. The great experience of the author as medical officer in charge of the New Zealand Government baths and sanatorium at Rotorua for 12 years before the war had well equipped him for the task which has since fallen upon him. The beautiful surroundings of the King George V. Hospital and of the sanatorium invite open-air treatment and it appears that nearly all cases are so treated. Colonel Herbert is to be congratulated on the ingenuity with which he has devised simple but efficient apparatus and on the good results achieved, all of which are well shown in the excellent illustrations of this book. It must not be supposed that because he insists on the value of these simple methods, he neglects the ordinary physiotherapeutic and electrical methods. These latter are adequately described and their use discussed.

From the fact that this volume is entitled Part. I. we hope that we may look forward to the appearance of another part dealing with injuries other than those of nerves.

The Theory and Practice of Massage. By BEATRICE M. GOODALL-COPESTAKE, Examiner to the Incorporated Society of Trained Masseuses; Teacher of Massage and Swedish Remedial Exercises to the Nursing Staff of the London Hospital. Second edition. London: H. K. Lewis and Co., Ltd. 1919. Pp. 265. 9*s.* net.

THE fact that only 15 months have elapsed since the appearance of the first edition of this book suggests that it has met a need. Our criticisms of the first edition have been largely met. Alterations in the chapters dealing with fractures, dislocations, and recent injury bring these matters far more nearly into accord with modern teaching. Colin Mackenzie's recent work receives recognition, with the result that the value of the chapters devoted to nerve affections is greatly enhanced. A new chapter on the after-treatment of war injuries is occupied in the main with a description of Mrs. Guthrie-Smith's well-known apparatus for the treatment of stiff joints, and the addition of a bibliography, though short, is welcome. Frequent smaller alterations in the text tend to convey a sense of confidence that was frequently lacking during the perusal of the first edition. The earlier part of the book still, we fear, conveys an unwelcome impression of stereotyped practice.

Manual of Lip-reading. By MARY E. B. STORMONTH. London: Constable and Co. 1919. Pp. 208. 5*s.* net.

Miss Stormonth's "Manual of Lip-reading" is intended to be an addition to a very limited branch of literature which it is by no means easy to extend. Teachers of lip-reading are so used to phonetics that perhaps they fail to realise how little the general public know about them. Any book on lip-reading intended for the use of the uninitiated should begin with a clear setting out of the phonetic system which is therein adopted. The omission of such a chapter is a great lack in Miss Stormonth's book. Mention is made of the need of natural speech, and stress might well be laid upon the need of distinctness of speech. No artificial way of speaking is required, but slipshod speech on the part of the teacher is a great drawback for the pupil. Apart from the caution given against the tendency of the teacher to exaggerate facial movements in voiceless speech, note might be made of the fact that the use of voice allows much greater natural play to the muscles of the face and throat. This is of considerable assistance to the learner and should not be ignored. Miss Stormonth seems to plunge at early stages into difficult words, and in dealing with the sounds set for each lesson treats them only as initial sounds. In Lesson I., for instance, treating of the sounds "a" and "p," a few preliminary easy words are given; then such words as "paralysis," "particular," and "paragraph" are introduced. Would it not have been equally satisfactory to have introduced the sounds in other positions, as in "tap," "clap," "happen," "appear"? The same remark applies to nearly every lesson.

Miss Stormonth has combined in a useful way the drill in words for the teaching of special sounds, with phrases on the "Look and Say" method. The two cannot be separated and give life to each other. Her advice as to the utterance and reading of sentences as a whole is very important, whilst the use of word-building is well thought out and applied. She has faced, too, the difficulty of saving the adult learner of lip-reading from intellectual boredom, though her stilted and unusual sentences dealing with the "parson" and "factor" are rather tiring. The latter part of the book is most helpful in its classification of subjects and collection of proverbs and phrases, for in the teaching of lip-reading, unless a careful plan is laid, most unwelcome blanks are liable to reveal themselves at inopportune moments. The book may well prove of use, not only to amateurs, but also to those who are already engaged in teaching the art of lip-reading.

Animal Parasites and Human Disease. By ASA C. CHANDLER, M.S., Ph.D., Instructor in Zoology, Oregon Agricultural College, Corvallis, Oregon. London: Chapman and Hall, Ltd. New York: John Wiley and Sons, Inc. 1918. Pp. 570. 21*s.*

THE aim of this volume is to present the chief facts of parasitology as related to human disease in such a manner as to appeal to the general reader or to the laymen interested especially in the progress of preventive medicine and public health. Primarily the book is not one for the professed parasitologist. Without too greatly encumbering the text with roundabout phrases, scientific terms have been omitted or, where used, have been explained. The book, it is hoped, will supply the needs of teachers of hygiene and members of the public health service. The work, too, will have its interest for the medical man. As a result of the war there are probably more cases of tropical infections in the British Isles at present than at any previous time, and the author will have the satisfaction of knowing that the publication of his book in this country is peculiarly opportune. Recent advances in this particular branch of medical knowledge are embodied in the text and numerous sections are devoted to treatment. The book is divided into three parts, dealing respectively with protozoa, "worms," and arthropods. No bibliography is given. Instead there is inserted a list of "sources of information," which includes all the leading periodicals in which articles dealing with parasitological subjects appear, as well as a comprehensive list of books covering the field of parasitology; it is suggested that the student will find all the bibliographical references which he may require in these.

As would be expected from an American writer, a telling description of the economic ravages of the hookworm is incorporated. In the Southern States no less than 2,000,000 of the population are affected by this parasite, and "unlike many diseases, this one has no tendency to weed out the weak and unfit; it works subtly, progressively, undermining the physical and intellectual life of the community, each generation handing down an increased handicap to the next." In the treatment of this disease oil of chenopodium is rapidly supplanting other remedies like thymol, than which it is not only more efficient but also less dangerous. The book is well up to date, and there are excellent chapters dealing with malaria and trypanosomiasis, but while the results of Leiper's researches on bilharzia are included in the article dealing with schistosomiasis, we fail to find any reference to trench fever in the section devoted to lice and disease.

The book contains more than 250 illustrations, most of which have been drawn by the author either from specimens or from other illustrations. Pen-and-ink drawings have been used consistently in place of photographs, and, what is important in a work of this kind, in the majority of figures the magnification is indicated.

The author has succeeded in providing a really interesting and informing treatise on parasitology in its relation to human disease, and we think he goes far to succeed in his wish that his book may be instrumental in arousing the interest of more students in this branch of science to the ultimate end of enlisting a larger number in the ranks of its workers. He insists that the need of the present time is not so much additions to our knowledge as the efficient application of what we already know.

THE degree of D.Sc. hon. caus. has been conferred by the University of Philadelphia upon Professor A. Hopewell-Smith, M.R.C.S., L.D.S.

JOURNALS.

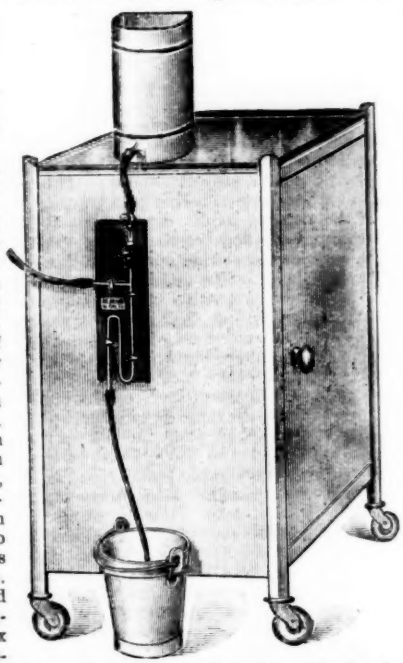
The Quarterly Journal of Medicine. Edited by WILLIAM OSLER, J. ROSE BRADFORD, A. E. GARROD, R. HUTCHISON, H. D. ROLLESTON, and W. HALE WHITE. Vol. XII., No. 47. April, 1919. Oxford: At the Clarendon Press: London, Edinburgh, New York, Toronto, and Melbourne: Humphrey Milford. Subscription 25*s.* per annum. Double numbers 17*s.* net each; single numbers 8*s.* 6*d.* net each.—The present number includes the following papers: 1. Intrathoracic Pressure in Hæmothorax, Pneumothorax, and Pleural Effusion, and Effects of Aspiration and of Oxygen Replacement, by George C. Shattuck and E. E. Welles. The measurements of intrathoracic pressure were made with a water manometer graduated in centimetres. Readings showed that the pressure in a sterile hæmothorax changes little in the first 16 days after wounding, but in the case of small hæmothoraces the respiratory excursion of pressure increases gradually during this time. Pressures observed in pleural effusions were similar to those in hæmothorax. By the simultaneous replacement of fluid by oxygen, volume for volume, the existing pressure in the pleural cavity could be maintained. 2. A Contribution to the Study of Contralateral Signs in Gunshot Wounds and Injuries of the Chest, by S. W. Curl. The author finds that contralateral signs are common, contralateral collapse being quite frequent. He emphasises the fact that the combination of physical signs supposed to be characteristic of solid lung is extremely fallacious and uncertain, since fluid effusions may give rise to identical signs. He considers that examination of cases by X rays, although helpful, is by no means sufficient for the differentiation of solid lung from a pleural effusion; and that the only safe guide is the exploring needle, and that this may fail unless used with discretion. He shows that in a small percentage of cases a fluid exudate may exist on the side towards which the heart is displaced, owing to the concomitant presence of a high degree of pulmonary collapse. 3. Two cases of Endocarditis due to *B. influenzæ*, by Archibald Malloch and Lawrence J. Rhea. In these cases bilateral broncho-pneumonia was present together with acute vegetative endocarditis. *B. influenzæ* was grown in pure culture from the terminal bronchi and from the centre of the vegetations in both cases. 4. The Therapeutic Action of Digitalis on the Rapid Regular Rheumatic Heart, by G. A. Sutherland. The writer illustrates his paper by accounts of ten cases in which he brings forward evidence to show that digitalis exerts a beneficial action even when there is no irregularity of the pulse. The drug, it is suggested, acts upon the auriculo-ventricular node and bundle, and where there is a sufficiency of sound contractile tissue in the ventricles leads to an effectual slowing of the ventricular rate. This contribution has a bearing upon a point at issue in a controversial correspondence which was carried on in THE LANCET in 1917. 5. Acute Leukæmia and so-called Mediastinal Leuko-sarcomatosis (Sternberg), with the account of a case accompanied by Myeloid Substitution of the Hilus Fat of the Kidneys, by F. Parkes Weber. Most cases of mediastinal leukosarcomatosis have not been recognised as such until a post-mortem examination has revealed their nature. In a recent case the author was able by the microscopical blood picture and Roentgen-ray examination to make the diagnosis of the condition during life. The case is of further interest in that post-mortem examination showed the presence of deep-red, spongy, bone-marrow-like tissue in the hilus of each kidney. An informing survey of the literature accompanies the description of the case. 6. Observations upon Two Cases of Diabetes Insipidus: with an Account of the Literature relating to an Association Between the Pituitary Gland and this Disease, by E. L. Kennaway and J. C. Mottram. In this important paper data are given as to the composition of the urine and its molecular concentration in comparison with that of the serum in two cases of diabetes insipidus. The authors show that pituitary extract given by subcutaneous injection leads to a diminution in the amount of urine excreted, and recommend the injection of pituitary extract as a means of treatment. This anti-diuretic effect of pituitary extract appears to be due to its direct action upon the kidney. The restoration of a normal state of the urine when pituitary extract is given in diabetes insipidus provides, in the authors' opinion, the strongest evidence that the normal activity of the gland is concerned, in part at least, in regulating the secretion of urine. While the morbid anatomical findings, till now recorded in the literature, are insufficient to establish that diabetes insipidus is constantly accompanied by disease of the pituitary, there is much to suggest that diabetes insipidus is dependent generally upon such morbid changes. The authors point out, however, that disease of the pituitary can occur without any symptoms of diabetes insipidus supervening. 7. The Filter-passing Virus of Influenza, by John Rose Bradford, E. F. Bashford, and J. A. Wilson; together with an Appendix of Clinical Notes on the Cases of Influenza from which the Virus was Recovered, by F. Clayton. This paper gives a detailed account of the extremely momentous investigations which the authors have been carrying out in their attempt to demonstrate the presence of a filtrable virus in the blood and other material obtained from cases of influenza.[1] That a filtrable virus was associated with influenza was first demonstrated by Nicolle and Lebailly,[2] who by the sucutaneous inoculation into the human subject of a filtrate of sputum from a case of influenza produced a febrile illness comparable with the naturally acquired disease. The methods employed by the present writers are those of filtration, cultivation of the filtrate, and animal inoculation. The types of filters employed are the Berkefeld N and V and the Massen porcelain filter. The filter-passer has been seen microscopically in the filtrate and has been cultivated therefrom by the Noguchi method. The organism, which has definite morphological and cultural characteristics, can be demonstrated in the blood, sputum, and other exudates, as well as in the tissues post mortem by appropriate methods of staining. Inoculated into animals the pure culture reproduces lesions similar in character to those found in the disease in man—viz., the sodden, hæmorrhagic lung, the fatty change in heart and liver, the inflamed kidney, and the peculiar hæmorrhagic lesion in the voluntary and cardiac muscles. The organism, moreover, can be recovered from these tissues, so that the conditions ordinarily known as Koch's postulates are fulfilled. The whole horizon limiting our outlook over the field of infective disease has been enormously extended by the application of Loeffler and Frosch's method of filtration to the investigation of human infections, and the work of Sir John Rose Bradford and his coadjutors goes to show that a rich harvest awaits the patient worker in this field.

[1] THE LANCET, 1919, i., 169.
[2] Nicolle et Lebailly, Compt. Rend. Acad. Sci., Paris, 1918, clvii., 607.

New Inventions.

A MODIFIED CATHCART'S APPARATUS.

THIS apparatus—in principle a Cathcart's but more compact and more easily applied—was devised in 1915 to cope with the spent fluid in the continuous irrigation treatment of wounds. It consists of a Canny-Ryall dropper connected to a metal T and siphon tube combined, the whole sunk in a wooden block which can be fixed to the patient's locker The illustration explains the working principle. The amount of fluid necessary to create a continuous suction force is 7½ oz. per hour when draining an open cavity, and considerably less when the cavity to be drained is a closed one. It has proved useful in draining appendix and psoas abscesses, the bladder, gall-bladder, and chest, and also for removing filtrates in a small laboratory. It is made by Messrs. A. E. Braid, 30, Gower-place, London, W.C., and is sold with right- and left-sided blocks from which it is easily removed for sterilisation by boiling.



L. A. CÉLESTIN, *M.C.*, M.D. Lond.

THE LANCET.

LONDON: SATURDAY, JULY 12, 1919.

The Liquor Traffic and the Public Health.

THE responsibility will shortly fall upon Parliament to decree the measures to be adopted in respect of the liquor traffic. The problem presented is an evergreen one in politics—it is to decide how and to what extent individual freedom shall be moulded for the public good; but where the control by the State of the sale of liquor is concerned the problem is one on which, to a greater degree perhaps than on any other social question, medical opinion has the right and the duty to speak with exceptional weight of authority. For the most serious results which ensue from the abuse of these beverages, and which, indeed, give to that abuse the importance of a social problem, are in the main ultimately reducible to the injurious influence of alcoholic excess on the bodily and mental health of the intemperate drinker. And this fact, that the effects of excessive drinking are chiefly manifest in disordered health, is not the only reason why the liquor problem in a special degree demands consideration from the medical point of view. The causes of intemperance, like its consequences, can only be justly appreciated when due regard is had to the fundamental facts concerning the action of alcohol on the body; and, as we shall have occasion to remark later on, the success achieved in dealing with alcoholism in this country in the last few years was obtained through the recognition of the truths of physiology in the enforcement of methods of regulation which were definitely and avowedly based on the indications of science. In all its more important aspects the liquor problem is essentially a medical problem, a problem of hygiene. And the new Commission, to whose jurisdiction the liquor traffic will be handed, will have to take this fact into consideration throughout.

The prevalence of alcoholism under the conditions obtaining to-day presents a striking comparison with its prevalence in the years before the war. It is, of course, to be understood that the statistical evidence which is available for such a comparison gives what is in certain respects an imperfect expression of the facts—that, for example, the deaths certified as due to alcoholism represent only a part, and doubtless a small part, of the mortality really attributable to alcoholic excess. This limitation, however, while it prevents us from regarding these statistics as any real measure of the amount of alcoholic mortality, does not affect their value as a standard for estimating the comparative frequency of intemperance in the two periods which we wish to compare. Taking, then, the year 1913 as representative of the state of things before the war, it appears from the official returns that under the then existent conditions of the liquor traffic there were in England and Wales 1831 deaths certified as due to or connected with alcoholism, and in addition to these there were 3880 deaths attributed to cirrhosis of the liver, while no less than 1226 infants under one year of age were suffocated in bed, well over a quarter of the latter fatalities occurring on Saturday nights. Further, in those Poor-law infirmaries—unfortunately few in number—where records on the point were kept, there were 786 patients treated for delirium tremens. In the same year the number of convictions for drunkenness amounted to 188,877, being at the rate of 1 to every 135 of the population over 15 years of age. If we turn now to the figures for the year 1918, we find that deaths from alcoholism numbered 296, a reduction of over 84 per cent. on the 1913 level, and that deaths from cirrhosis of the liver fell to 1671, a decline of nearly 60 per cent., while deaths of infants from suffocation numbered 557—that is to say, they were more than 55 per cent. below what they were in 1913, and the predominant incidence of these deaths on Saturday nights, so marked in that year, no longer existed. Again, in the same institutions referred to above as furnishing returns of cases of delirium tremens, the number of patients treated for that disease in 1918 amounted only to 32, thus showing a decrease of no less than 95 per cent. on the figures for 1913. Finally, convictions for drunkenness totalled 29,019, or very little more than one-sixth of the number recorded in 1913. It might, perhaps, be suggested that the reduction in intemperance indicated by these figures is to be ascribed in part to the absence on military service of large numbers of adult males, but this explanation breaks down in view of the fact that the decrease has been equally or even more marked in the case of women. Thus deaths of women from alcoholism fell from 719 in 1913 to 74 in 1918, a reduction of nearly 90 per cent.; deaths from cirrhosis similarly declined from 1665 to 579, a fall of approximately 50 per cent., and in the Poor-law infirmaries keeping records of delirium tremens the cases of that disease in women, which numbered 214 in 1913, were only 6 in 1918. And, corresponding with this reduction in alcoholic disease and mortality, convictions of women for drunkenness declined from 35,765 to 7222, a reduction of practically 80 per cent. These figures provide adequate proof that during the war there has been in this country a real and substantial decrease of alcoholism; and since the greater part of the decrease followed immediately on the enforcement of the war-time regulations for the control of the liquor traffic, it is legitimate to conclude that these regulations were the chief agents in bringing about the improvement in national sobriety.

Alcoholism is, of course, a much bigger factor in the causation of disease and mortality than can be shown in official statistics, which necessarily represent only its most extreme and obtrusive results; and the improvement effected through the system of liquor control is correspondingly more important than is indicated by the evidence summarised above; but even if that evidence be taken merely at its face value, it will enable us to form some idea of the price, measured in terms of health and efficiency, which the community would have to pay for the full restoration of pre-war conditions in the liquor trade. Possibly public opinion would be prepared to pay that price, heavy as it is, if the regulations necessary for the control of alcoholism constituted a serious encroachment on public freedom and convenience. And on such grounds objection may, no doubt, be urged, and with some reason, against certain of the proposals which have recently been advocated under the guise of temperance reform, and notably against the method of direct limitation of the output of

liquor—a method which, when enforced by the Food Controller in the later stages of the war as a necessary measure for conserving cereal supplies, did, in fact, excite much irritation and unrest in the industrial classes. But no such criticism can lie against the policy of controlling alcoholism by regulating on physiological lines the hours and conditions of the sale of alcoholic beverages. This policy — in a form more stringent, maybe, than would be necessary or desirable in time of peace—was adopted by Lord D'ABERNON and the Liquor Control Board for the purpose of promoting the national efficiency during the war; it is a policy which does not involve any interference with the legitimate freedom of the temperate consumer of alcohol, and does not occasion any appreciable inconvenience to the general public—certainly none that is worth weighing against its great and unquestionable influence in promoting the well-being of the community. It contains, in a word, the minimum amount of restriction which is consistent with effective action in the control of alcoholism. And in this matter restriction of some sort is inevitable; not even the most extreme individualist has seriously proposed that there should be entire and absolute freedom in the production and sale of alcoholic beverages. The question is whether the restrictions which will be imposed by the new Commission are to be grounded on scientific principles and directed to safeguarding the health and efficiency of the nation.

The Epidemiology of Pyogenic Infection.

No peace terms have been signed in man's warfare with bacteria, and there is little prospect of a truce with the minute vegetal foe. The ups and downs of the conflict have been closely studied in the case of typhoid, where success has fallen to man, and in so-called influenza, where the laurels must honestly be awarded to the other side. Dr. W. H. HAMER begins a report just published with the words: "The year 1918 stands out as a great influenza year." Of equal interest is the story of the struggle with the organisms which gain access to the body through obvious breaches of surface. While the war hygienist has taken some credit for the comparative absence of typhoid, typhus, and other such plagues from the Flanders front, no such congratulation is possible in regard to the epidemic diseases of wounds; for the wounded man, as Sir ALMROTH WRIGHT once reminded us, is simply a sick man with some surface discontinuity. Dr. W. W. C. TOPLEY'S Goulstonian lectures, the second instalment of which we print this week, serve a useful purpose in bringing exact thought to bear upon the spread of bacterial infection from the standpoint of the bacteriologist. Three explanations are possible when confronted with epidemic disease: an increase in the power of the parasite to produce disease, a decrease in the resistance of the host, and some alteration in the surrounding circumstances furthering the transference of parasites from case to case. Dr. TOPLEY adds that the whole of biological knowledge is against the occurrence of a considerable epidemic in which the pathogenicity of the parasite and the resistance of the host remain constant, and rules out the third alternative as of minor importance. But he is speaking primarily of infections which enter the body through an intact surface.

There is, however, one organism, which has played a leading rôle in the drama of war wounds, in regard to the spread of which circumstances may chiefly be to blame. This is the type of hæmolytic streptococcus described in a paper by Mr. A. FLEMING and Dr. A. B. PORTEOUS on page 49, which has been held responsible for almost all the severe septic complications of wounds in Flanders and for all the streptococcal septicæmia. The number of its victims has been so large as to constitute an epidemic in the strict sense of the term, although an epidemic of very special character. Put briefly, this streptococcus was found actually responsible for a large number of deaths in those who "died of wounds," for a still larger amount of disability from continued suppuration, for various forms of infected skin lesions and joint infections, and, finally, for certain outbreaks of pharyngitis and laryngitis, as well as of pneumonia and pleurisy. An important committee was set up in 1918 by the Medical Service in France to deal with it. Any complete report on methods of prevention and treatment was first impeded by the rapid advance of the summer and then cut short by the cessation of hostilities. But the results obtained threw some light upon the origin of the infection. At a research casualty clearing station it was found that of patients admitted to the station a few hours after infliction of their wounds only a small proportion, under 15 per cent. in fact, were infected at that time with the hæmolytic streptococcus. Quite other was the experience at the base. Mr. FLEMING and Dr. PORTEOUS found that in a series of a hundred septic wounds remaining at a base hospital for over seven days this streptococcus was present in almost every case. Infection therefore presumably arose somewhere after the field dressing stage. Following up the search, they examined during last summer gauze packs removed from wounds on arrival at the base, and found the hæmolytic streptococcus in nearly every one when the man had been kept at the casualty clearing station for more than a week, whereas with the man sent straight on to the base the organism was present in 15 out of 75 excised wounds—that is to say, in only 20 per cent.

It would seem, as these authors state, a warrantable deduction that the streptococcal disease of wounds is in most cases a hospital infection, probably conveyed from patient to patient in the dressing of the wound. But while admitting the fact of infection at hospitals, other possibilities exist in regard to its conveyance than by manual transmission from wound to wound. At certain concentration camps in the United States of America it was noted that of new recruits entering the camp only a small proportion harboured streptococci in their throats, but after a short stay the majority were thus infected. It is at least possible that as with the meningococcus so with the streptococcus, some people are constant carriers of infection. Here Dr. TOPLEY is again enlightening. His conception is of a virus of a given disease being distributed fairly widely through the world as a comparatively harmless parasite on the human host, taking on during epidemic periods a new and sinister rôle. Under conditions of campaigning it may well be that the streptococcus carried in the throat gains an increased power of producing disease. Nor is the streptococcus the only pyogenic infection whose virulence or infectivity has become enhanced under war conditions. Mr. JOSEPH CUNNING'S recent letter to our

columns on epidemic perinephric suppuration elicited from Sir THOMAS HORDER the opinion of a general rise in the incidence of staphylococcus infections. Furunculosis, sycosis, impetigo, blepharitis—all have been rife of late and individual cases more severe than usual. Soldiers returning home have apparently brought with them a more virulent strain of staphylococcus. Evidently pyogenic infections deserve the careful study of the epidemiologist.

The Sense of Stability and Balance in the Air.

IN the monograph on the above subject recently added to the valuable series of special reports published by the Medical Research Committee[1] Dr. HENRY HEAD, F.R.S., records investigations made upon both normal and abnormal subjects from the point of view of flying. Of particular interest is the section dealing with the sensations experienced by normal persons in heavier-than-air-machines. It is shown that conscious stability and comfort in the air depend primarily on the normal response of three groups of sense organs—namely, the vestibular apparatus, the eyes (including the eye muscles), and the proprio-ceptive system with its endings in muscles, tendons, and joints. Defective response from any one of these afferent end-organs disturbs the sense of equilibrium in the air, and leads to actions that affect the stability of the aeroplane. The report indicates that undue importance has hitherto been attached by many experts to the vestibular apparatus. It has become increasingly apparent to those connected with flying that although the sense of stability is dependent upon the integrity of the vestibular apparatus, the importance of the afferent impulses streaming in from eyes and the proprioceptive system must not be overlooked. An expert pilot finds it impossible to fly a machine with his eyes bandaged, and under these circumstances derives most of his information from cutaneous sensation and from the nerve endings in muscles, tendons, and joints. It is well known, as in the case of the recent Atlantic flight by ALCOCK and BROWN, that when the sense of vision is cut off the pilot loses himself in space, and may emerge from a fog or cloud with his machine at a steep angle or even upside down. Under these circumstances he is dependent almost entirely upon instrumental guidance for flying, and it may be that in future some instrument, such as Sir HORACE DARWIN'S "Turn Indicator," will be fitted to machines and be largely relied upon to give the pilot information in respect of his position to the earth.

Taking seriatim the chief points of interest brought out by Dr. HEAD: While flying an aeroplane an otherwise healthy man may suffer from disorders of vestibular and visual sensibility due to temporary causes. Such are giddiness through inability to regulate the tension in the middle ear with sufficient ease during a rapid descent, and defective visual orientation due to the development of heterophoria owing to disturbance in function of the eye muscles. Dr. HEAD shows that in some men, otherwise normal, rotatory stimuli produce a more powerful reaction than in the majority of their fellows. They become giddy easily. As children they could not swing with pleasure, and some of them were habitually sick in the train. Such persons are not suffering from a pathological condition; their disability arises from the fact that sensory impulses from the semi-circular canals are not checked and controlled to the same extent as in the majority of healthy individuals. Consequently, when exposed to disturbances of equilibrium to which a normal man would adapt himself unconsciously, they suffer from discomfort, become giddy, and may even vomit in the air. Many who were giddy when first exposed to acrobatic evolutions succeed in conquering this disability. They learn to fly with ease, and the acquisition of this new facility is associated with control of the primary afferent impulses from the auditory and visual apparatus. Any condition which produces diminished control by the highest faculties over the activity of lower centres is liable, however, to lead to regression to the earlier mode of reaction. All healthy men can be affected if the intensity of the rotatory stimulus is pushed up to sufficiently high degree. This may occur either from the fact that the head is held in some unusual position, as, for example, when looking upwards during spinning, or the actual rotation may be mechanically increased in rapidity. In some cases the reaction to such excessive stimulation takes the form of giddiness, with or without nausea; in others it is associated with that withdrawal of consciousness known as "fainting." When a man is made giddy he is in a state of confusion with regard to his relations in space. In the preliminary stages of "fainting" his horizon is restricted and the world around disappears. Both states, pushed to the limits of endurance, end in unconsciousness.

Complete adaptation to disturbances of equilibrium in the air is associated with automatic control of the afferent and efferent activities of lower levels of the central nervous system. The normal pilot merely desires that his machine shall behave in a certain manner and the evolution occurs. This acquired facility can be disturbed by any condition which leads to diminished control. Just as a golfer can be "put off his game" by some physiological or mental state, so the aviator may lose his capacity to fly in consequence of conditions that vary so widely as a gastro-intestinal attack or domestic anxiety. Exhaustion, insomnia, the distress of war flying, anxiety, or fear can all lead to defective afferent and efferent control. Efficient automatic response is no longer possible, and the pilot begins to fly badly and to make bad landings. This loss of control over the activity of lower levels may be manifested, however, not only in bad management of the machine, but also in some dangerous reaction, such as "giddiness" or "fainting" in the air. When this abnormal reaction assumes the form of giddiness and nausea it is found in most cases that the patient has suffered from some discomfort when he first went into the air. Inquiry will usually reveal also that he was unable to swing with pleasure as a child, and that he tended to be sick when travelling by train. In this group rotatory impulses, when released from control, manifested their influence in giddiness, usually accompanied by nausea. When the reaction takes the form of "fainting" it is generally found that the subjects enjoyed their first flight and could swing with pleasure. Their resistance to vertiginous impressions was high and no excessive giddiness resulted, but they could induce the effects of shock with undue facility. Dr. HEAD

[1] Medical Research Committee Special Report Series No. 28. Reports of the Air Medical Investigation Committee, "The Sense of Stability and Balance in the Air."

has performed signal service in drawing attention to the importance of regression in the airman, and showing that this may be produced by mechanical, physiological, or psychical causes.

In dealing with the tests for estimating the sense of balance used by the Examining Board of the Air Force Dr. HEAD criticises them adversely, since the results of the tests employed have, as is so commonly done, been entered frequently under heads such as "nervous debility," "muscle sense," and "vestibular stability" rather than under a heading indicating the actual tests employed. In his opinion the tests do not afford information in regard to the conditions they were designed to investigate. It is shown that the tests are of value in revealing the existence of some abnormal functional state, but are not otherwise an indication of ability to fly. Dr. HEAD, however, is not correct in his belief that the results of the tests employed have not been entered in detail on the admission forms of candidates for the Royal Air Force, and in this way has, no doubt quite unintentionally, done an injustice to the authorities concerned in his criticism of their records. We understand that many thousands of results of tests have been so entered, although, as indicated above, possibly under a wrong heading. A future study of these data will serve as a control to the experimental conclusions arrived at by Dr. HEAD as a result of the employment of the same tests. In conclusion, Dr. HEAD is to be congratulated on the way in which he has collected, described, and analysed individual examples of various abnormal states that may make their appearance during flight. The paper is a stimulating and original contribution to the medical aspects of flying.

A Memorandum on Malaria for General Practitioners.

Sir RONALD ROSS and Lieutenant-Colonel S. P. JAMES have drawn up, for the information of medical practitioners, a booklet of suggestions for the care of malaria patients, which has been issued by the Ministry of Pensions and is to be obtained for 1*d*. from H.M. Stationery Office. An introductory section calls attention to the considerable number of demobilised men who have become infected with malaria during service abroad. These men will be entitled to receive treatment from Insurance practitioners, and it is the object of the Memorandum to bring within small compass particulars as to the nature of the disease, its clinical and other characters, the lines of treatment found to be most successful, and the measures necessary for preventing its spread. The medical man to whom malaria is reported must satisfy himself that the diagnosis is correct, supervise the treatment so as to cut short the attack, and notify the case to the medical officer of health. The Memorandum describes the three chief types of malarial fever, giving the main characteristics of benign and malignant forms, concluding with "pernicious symptoms" and the condition of "malarial cachexia." Differential diagnosis is considered clinically, microscopically, and in relation to the "therapeutic test." Quinine treatment and after-treatment are then dealt with at length. An appendix cites the relevant portions of the Local Government Board regulations in regard to notification.

Annotations.

"Ne quid nimis."

AMERICAN HOSPITAL FOR GREAT BRITAIN.

THE plans for the American Hospital are now in so advanced a stage that a meeting of the Governing Council will be held next week at the House of the Royal Society of Medicine, at which Lord Reading (who has accepted the Presidency of the Hospital) and the American Ambassador have promised to be present. Upon the signing of the Armistice last November the moment seemed ripe for bringing the project of an American hospital to the consideration of the medical profession in Great Britain, as well as to the American colony in London. Not only were the needs of the foundation of such a hospital obvious, but the exceptional opportunities of the moment were never likely to be repeated. The medical professions of America and Great Britain have hitherto worked too much apart, although each has much to learn from the other. The incidence of the war has brought them into closer contact. For two years American medical men have been attached to British units in the field, and have worked side by side with their British confrères upon the staffs of military hospitals in all parts of England and Scotland. The comradeship brought about by such friendly coöperation and interchange of scientific knowledge must be of vast importance in the future history of the two nations. A medical executive committee, consisting of Sir William Osler, Sir Arbuthnot Lane, Sir Humphry Rolleston, Sir John Bland-Sutton, Mr. J. Y. W. MacAlister, and Mr. Philip Franklin, sat in London and discussed the scope of the hospital; and at the Congress of the American Surgical and Medical Associations held in Atlantic City last month, Sir Arbuthnot Lane notified officially its establishment, pointing out that no more fitting monument could be raised to the fallen than a hospital designed to form the headquarters for American medical men who visited Europe for the purposes of post-graduate study. At this Congress the plans of the committee were received with enthusiasm, and Sir Arbuthnot Lane was assured by leading American medical men that their profession was keenly alive to the great value which such an institution might have as a centre for study and research.

A committee was then formed to establish the coöperation of American doctors upon a definite footing and to act in conjunction with the executive committee in London, and, if desirable, to operate under the National Research Council at Washington. This American Committee consists of Dr. George W. Crile, of Cleveland, appointed by the American Academy of Sciences on International Relations; Dr. W. J. Mayo and Dr. Charles H. Mayo, of Rochester, Minnesota; Dr. Albert J. Ochsner, of Chicago; Dr. Rudolph Matas, of New Orleans; and Dr. Franklin Martin, of Chicago, appointed by the American Gynæcological Association. This committee will send a delegate to London to assist the medical committee here in the detailed organisation of the hospital, which has been planned upon the most modern lines in every department of medical and surgical activity and of research directed towards every class of patient. A research institute, modelled upon the Rockefeller Foundation of New York, will form an integral part of the building.

The consulting staff will bring together distinguished members of the medical profession in the two countries. The visiting staff will be nominated by the executive medical committee.

The governing council of the hospital, which is likely to have for its patrons the highest personages on both sides of the Atlantic, consists of many prominent members of the American colony in London, including Mr. Walter Blackman, Mr. George M. Cassatt, Mr. R. Newton Crane, Mr. Wilson Cross, Mr. Clarence Graff, Mr. James Benson Kennedy, Mr. J. Blair MacAfee, Mr. George A. Mower, Mr. F. E. Powell, Mr. Henry E. Stoner, Mr. F. C. Van Duzer, and Mr. E. Bradner White, with Mr. Philip Franklin as honorary secretary.

LIGHT SENSE.

FOR a study on the "Performance of Night-glasses" we can recommend Bulletin No. 3, by L. C. Martin, D.I.C., &c., published for the Department of Science and Industrial Research by H.M. Stationery Office. The whole subject of light sense is indifferently understood. When we pass from bright sunlight to a dimly lighted room we can see nothing until our eyes have become adapted to the dark. This adaptation is supposed to depend principally upon some change in the relation between the bacillary layer of the retina and the adjoining pigment, and takes three-quarters of an hour or more to become complete, and in the second place upon the dilatation of the pupil, which occurs very rapidly. It is a curious fact that the fovea is physiologically night-blind, for a fully dark-adapted or scotopic eye is found to have a central scotoma; round the fovea is a ring that is most sensitive to light, and beyond this ring the light sense fades gradually towards the periphery. Again, the scotopic eye is colour blind, but on the admission of more light the first colours recognised are yellow and blue, after them the greens, and, finally, the reds. On a dark night the grass looks grey, while the colour of yellow flowers may still be distinguished, but the red geraniums appear black. As there are no rods in the fovea, though they are found in increasing numbers towards the periphery, it will be seen that there are some good *prima facie* grounds for considering the rods as the percipient elements for light sense and the cones for colour sense.

The light sense may be tested in two different ways: (1) Light difference (L.D.): The estimation of the smallest difference of brightness that can be appreciated between two sources of nearly equal luminosity; and (2) light minimum (L.M.): the estimation of the smallest quantity of light that can be recognised in a faintly illuminated patch on a black background. Ophthalmologists find that L.D. is most affected in diseases of the optic nerve, but that L.M. is chiefly diminished in glaucoma and in diseases of the retina and choroid. It is found that practice increases the L.D. sensibility enormously, and, indeed, the results of L.D. and L.M. tests vary so greatly in different individuals that no definite value can be assigned as the standard of either. When Professor E. M. Barnard (Yerkes Observatory, U.S.A.) found that he could detect a wire at such a distance that its diameter only subtended an angle of 0·44″ (i.e., less than half a second) at the nodal point of his eye, it is a proof of his extraordinary sensibility to light difference; it is no test of his form sense. The minimum visible for form sense is 53·1″, and is usually taken to be 1′. Many tests that are supposed to deal with the form sense are really only testing L.D. Even the dot test cards that are so frequently used fall under suspicion for this reason. In practice this may not be very serious, as in many callings an adequate light sensibility is more important than a superior form sense. On a dark night most people have found that they see better without their spectacles than with them, as then they are relying upon their light sense and not upon their form sense, which is improved by increased definition. Every optical instrument entails some loss of light from absorption and from reflection at the surfaces of the glass; and yet, as is well known, telescopes enable one to see stars that are invisible to the naked eye, and night glasses are of invaluable use to the mariner. The principles underlying these two instruments are entirely different.

The apparent brightness of a surface in ordinary circumstances, if the size of the pupil remain constant, simply depends upon the intrinsic brightness of the surface. A piece of white paper 1 in. square at a distance of 4 ft. is as bright as a piece 1 ft. square. If, however, an object be so small that its image only falls on part of a bacillary element, unless it be exceedingly bright it may not succeed in stimulating this element. When faint stars are observed through a telescope their apparent size is not increased, for they still subtend an angle less than the minimum visible, but all the light which falls on the object glass may by a suitable eye-piece be concentrated on the observer's pupil, neglecting the light lost by transmission through the instrument. The action of the telescope is tantamount to increasing the area of the pupil to that of the object glass, and hence the brightness of the faint star is virtually increased. If, however, the object viewed subtend an angle (e.g., 10′) greater than the minimum visible, no optical instrument can increase its brightness per unit area. Yet, as is well known, in the dusk a night-glass enables objects to be seen that are invisible to the naked eye, although telescopes with a magnification of 20 or so will prevent objects being seen that can be dimly distinguished without it. Similarly, all microscopists have noted that when high eye-pieces are used the field becomes much darker. This is simply because the emergent beam of light from a high ocular is so thin that only part of the pupil is filled with light; indeed, the pupil receives far less light than when a lower eye-piece is used. Now one advantage of a Galilean binocular is that the section of the emergent beam is never less than that of the pupil and, consequently, no light is lost from this cause. But we have said that the brightness per unit area cannot be increased, how then can the visibility of an object in a dim light be increased by night-glasses? All workers agree that the minimum intrinsic brightness necessary for the perception of an object varies greatly with its size. It is clear, then, that night-glasses with a magnification of 4 or 6 will increase the visibility of objects in a dim light owing to their increased apparent size. We may at once conclude that as long as the section of the emergent beam is not less than the pupil of the observer's eye advantage will be gained by increasing the magnification; but if the sectional area of the emergent beam is less than that of the pupil the image may become even

dimmer than the object when seen by the naked eye. Piper[1] has pointed out that in dark-adap ed eyes the light sensibility is about twice as great with both eyes as with one, though in light-adapted eyes no such binocular summation takes place.

THE BRITISH SCIENTIFIC PRODUCTS EXHIBITION.

UNDER the auspices of the British Science Guild a very interesting exhibition of British scientific productions was opened by Lord Crewe at the Central Hall, Westminster, on Thursday, July 3rd. Encouraged by the success which attended a similar exhibition held last year at King's College, the authorities were amply justified in promoting another exhibition this year, the objects of which are to illustrate recent progress in British science and invention, and to help the establishment and development of new British industries. The demonstration is most instructive, and evidences in many directions the capacity and skill of the British manufacturer in acquiring new industries and in restoring old ones on a scientific basis. There is, indeed, a wealth of products shown, illustrating in the most satisfactory way a determination to press science into industrial service and to remove the long-standing reproach of our dependence on other nations for the supply of many valuable and important commodities. And there is a noble record presented of the work done in the research laboratories of the universities and schools of England. All is an eloquent story of the successes gained by the men trained in the scientific and technical laboratories. Mechanical science, physics, textiles, electrical appliances, medicine and surgery, paper and illustration, agriculture, chemistry, aircraft, fuels, and metallurgy form most interesting sections, in which examples are numerous enough of the talent, skill, and energy not yet lost to our race. Synthetics and dyes are conspicuous illustrations of recent commercial successes resting on scientific foundations, and the exhibition of optical glass and laboratory glass ware demonstrates a brilliant dual triumph of scientist and manufacturer. The great drug houses are well represented, showing what an essential equipment to the success of their business is the research laboratory. This opportunity of witnessing the remarkable developments arising out of the events of the war which have taken place in so many departments of our great industries should not be lost. The bearing of science upon industrial success and national prosperity is well brought out. The exhibition continues until August 5th.

THE MEDICAL AND DENTAL REGISTERS.

THE official Register of the General Medical Council, which has just been issued, contains the names of 43,926 persons, of whom 54 per cent. are on the local Register for England, 32 per cent. on that for Scotland, and 14 for Ireland. 1077 names were registered in 1918, being the smallest number recorded for a quarter of a century except at the low tide of 1910–11. On the other hand, the net increase of 107 registered names at the end of 1918 as compared with 1917 is quite without precedent in its smallness. The previously leanest years had some compensation, lacking in 1918, in names restored to the Register and short death rolls. The additional names registered during 1918 included 148 colonial and 16 foreign diplomas, for the most part Belgian. 995 names have been removed from the Register during the year, 946 on evidence of death. Only one medical man has formally removed his name from the list as having ceased to practise.

The official Dentists Register for 1919 contains the names of 5567 dentists, of whom 13 are on the colonial and 19 on the foreign list. Of the 5535 United Kingdom dentists, 4290 hold degrees or licences in dental surgery, and 1245 are registered on their own declaration of being in bona-fide practice of dentistry. Of the former, 461 have additional surgical or medical qualifications, of the latter 7. The number added by registration during the year 1918 was 131, being one in excess of the figure for 1917 and barely one-half of the 1915 record. 102 names were removed on evidence of death, none on ceasing to practise.

EPIDEMIC ENCEPHALITIS (NONA).

A USEFUL contribution[1] to the subject of epidemic encephalitis, from the pen of Dr. Peter Bassoe, associate professor of medicine, Rush Medical College, Chicago, shows that the disease has made its appearance in America, with similar clinical and pathological features to those frequently described in this country and on the continent. Sainton has attempted to give a definition of the disease in the following terms: "A toxic, infective, epidemic syndrome, characterised clinically by the triad lethargy, ocular palsies, and a febrile state, and anatomically by a more or less diffuse encephalitis, most marked in the grey matter of the midbrain." It may be questioned, however, whether any useful purpose is served at present by condensed definitions; Sainton's is not sufficiently explicit to be distinctive. The association of epidemic encephalitis with influenza appears to be more than a mere coincidence, since it has been noted on a number of occasions. Dr. Bassoe quotes from a French source that Camerarius, who described an influenza epidemic in Tübingen in 1718, mentioned a "sleeping sickness" in connexion with it. In 1768, Lepecq de la Cloture recorded a "coma somnolentum" after influenza, and Ozanann (1835) mentioned epidemics of "catarrhal fever" with "soporosité" as having occurred in Germany in 1745, in Lyons in 1800, and in Milan in 1802. No doubt much of this is vague and indeterminate; influenzal meningitis is a different affection altogether, and what (much or little) of these epidemic conditions should be classed as encephalitis lethargica is a matter depending really on the interpretative proclivities of the reader. Dr. Bassoe describes 11 cases in his paper, and notes that in no one had there been definite preceding influenza, but suggests that the encephalitis "may be caused by a separate virus, which in order to become active must have been in contact at one time or another with that of influenza." Be this as it may, the bacteriological aspect of the question has been less completely investigated than the clinical and pathological, and has scarcely passed the stage of conjecture. It is an interesting observation that the brain-stem and basal ganglia are particularly liable to be affected by poisons, endogenous or exogenous, though why this should be so is not at present clear. Dr. Bassoe has had the opportunity of making a complete pathological examination in two cases, and has found the changes with which previous writers

[1] Ztsch. f. Psychol. u. Physiol. d. Sinnesorg., xxxii., 98., 1904.

[1] Journal of the American Med. Assoc., April 5th, 1919, p. 971.

have made us familiar—œdema, congestion and minute hæmorrhages, these most numerous in brain-stem, basal ganglia, and centrum ovale, dense accumulations of small cells round the vessels, and comparatively little evidence of necrosis or tissue destruction. In his cases there was but little sign of inflammation in cortex or meninges. He makes the interesting remark that there is not so much real sleep as is indicated by the sleepy expression of the patient; in fact, some actually suffer from insomnia, "lethargy" bearing the same relation to sleep as the compulsive laughter of the patient with pseudo-bulbar paralysis does to a normal laugh. Among other clinical features also observed in various English cases may be specified coarse choreiform jerkings, which sometimes have become very troublesome, and which Dr. Bassoe has been able to control temporarily with scopolamine. There is much more evidence than the casual observer would suspect to support the contention that the lethargy of these patients is a local and not a general symptom. The laboratory tests of the spinal fluid in Dr. Bassoe's 11 cases show that the cell content was less than 10 in the majority, with a maximum of 26; the fluid was always clear, and usually gave a slight increase of globulin. Results of cultures of blood and spinal fluid, both during life and after death, were negative. No bacteria were seen in section of the brain.

SIR CLIFFORD ALLBUTT'S PORTRAIT.

THE fund for presenting the President of the British Medical Association with his portrait remains open by request during the present month. Subscriptions have recently been received from India and America. The treasurer, Dr. G. E. Haslip, in a letter which appears in our correspondence columns, invites all those who wish to take part in the presentation, but who have not yet notified their intention, to do so without delay. After the portrait in oils has been painted it is intended to commission a mezzotint engraving from it, which subscribers to the fund will be able to purchase for their own collections.

RABID IGNORANCE.

THE worst kind of ignorance is that which springs from an instinctive refusal to acknowledge the truth. The Arabs long ago recognised how obstinate and intractable is this affliction when they said: "He that knows not, and knows not that he knows not, is stupid. Shun him." To argue with such people is clearly waste of time, for no amount of reason can prevail against a well-established complex. But to ignore the victims entirely would be as foolish as merely to avoid the company of a dangerous criminal. Indeed, if the definition of crime be a fairly broad one, such people are dangerous criminals, for, as Dr. Johnson says: "He that voluntarily continues ignorant is guilty of all the crimes that ignorance produces." The stamping out of rabies in this country 30 years ago was carried through in the face of violent and prejudiced opposition. It could hardly be expected that the arguments then used against the Muzzling Order of 1885 should be brought forward again to-day. Yet such does actually appear to be the case. At a recent meeting of the Animal Defence and Antivivisection Society (in the words of its secretary) strong feeling was expressed at the unscrupulous way in which the present scare is being worked up. "To prevent rabies in dogs," he writes "it is essential that they should be well and carefully fed, given plenty of water, enough exercise, and not kept in the sun." By such well-meaning people the currency of truth is debased and it becomes important that the real nature of rabies and hydrophobia should be placed before the public by competent authorities in order that such misleading statements as that quoted above may be recognised at their true value. The Society for the Prevention of Hydrophobia, founded in 1886, is still, we are glad to say, in existence, and their first secretary, Mr. Frank Karslake, has rendered a valuable service in reissuing his pamphlet first published in 1889.[1] The arguments used in it remain as true to-day as they were at that time, and various additions have been made which bring them into more intimate contact with the world of to-day. May it have a wide circulation amongst the open-minded public, for it is a valuable prophylactic against the views of those who know not that they know not and are still at large. More than 200 cases of rabies have now been confirmed, and recent reports show that the disease is by no means arrested, a new outbreak having occurred this week. Dr. Addison, speaking last week on a vote to liquidate the Local Government Board, stated that 54 notifications had been received of persons bitten by rabid dogs, and of these 19 were sent to Paris for antirabic treatment; 24 were treated in England with vaccine obtained from the Pasteur Institute in Paris, and 11 others with vaccine prepared in the Board's own laboratory. In no case had hydrophobia resulted, and this admirable achievement of preventive medicine has been used by unscrupulous persons to suggest that no need for any treatment exists. Those who have been saved from the risk of a painful and horrible death will think otherwise, and the public meeting held last week in London under the auspices of the Kennel Club was unanimous in recommending the common-sense measure of a general Muzzling Order throughout the country. The Board of Agriculture may be assured of the support of well-informed public opinion in enforcing whatever regulations may be found to be necessary once again to deliver from this curse both man and his most faithful beast.

THE PATHOGENESIS OF DEFICIENCY DISEASE.

A VERY interesting contribution to the literature of this subject has recently been made by Lieutenant-Colonel R. McCarrison, I.M.S., of the Pasteur Institute of Southern India, in the *Indian Journal of Medical Research* (vol. vi., No. 3), in which he discusses the origin of diseases attributed to a deficiency of certain accessory food factors. He draws attention to the scantiness of our knowledge respecting the influence of "vitaminic" deficiency on the adrenal glands, pancreas, liver, spleen, thyroid, pituitary gland, and the reproductive organs, and he endeavours to fill up some of these gaps in our knowledge. Taking beri-beri as the typical deficiency disease, he expresses the opinion that "vitaminic" deficiency is the essential ætiological factor in the genesis of that malady, but that such deficiency is rarely so complete as to be the sole agency responsible for it. Bacterial organisms of whatever kind that may be isolated from the blood in human beri-beri may invade the blood and tissues under conditions of dietetic

[1] Rabies and Hydrophobia: their Cause and Prevention, by Frank Karslake. London: W. and G. Foyle. 1919. Price 1s.

deficiency and thus convert a state of potential morbidity into one of kinetic disease. Such organisms are not the cause of the malady, nor can they be expected to produce it in inoculation experiments. "They are but weeds which flourish in a soil made ready for them by dietetic deficiency." After making many animal experiments and observations Colonel McCarrison arrives at the conclusion that the absence of certain accessory food factors from the dietary—improperly called "anti-neuritic"—leads not only to functional degenerative changes in the central nervous system, but to similar changes in every organ and tissue in the body. The symptom-complex resulting from the absence of these substances is due (1) to chronic inanition; (2) to derangement of function of the organs of digestion and assimilation; (3) to disordered endocrine function, especially in the adrenal glands; and (4) to malnutrition of the nervous system. Certain organs undergo hypertrophy and others atrophy. Those which hypertrophy are the adrenals, and those which atrophy are, in the order of severity, the thymus, the testicles, spleen, ovary, pancreas, heart, liver, kidneys, stomach, thyroid, and brain. The presence of œdema in the patient has been invariably associated with great hypertrophy of the adrenal glands. Wet and dry beri-beri are essentially the same disease, the former differing from the latter in the greater derangement of the adrenal glands. Gastric, intestinal, and pancreatic disorders are important consequences of a dietary too rich in starch and too poor in vitamines and the essential constituents of food. It is suggested that some of the obscure metabolic disorders of childhood might be examined from this point of view as well as from that of endocrine gland starvation. Profound atrophy of the reproductive organs is also an important consequence of vitaminic deficiency, leading to the cessation of the function of spermatogenesis. In the male human subject it would result in sterility, and in the female in amenorrhœa and sterility. This would no doubt account in a great measure for the recent occurrence of so-called "war amenorrhœa," about which much has been written recently in the foreign press, and particularly in Germany. The central nervous system atrophies little, the paralytic symptoms in beri-beri being due mainly to impaired functional activity of nerve cells, much more rarely to their degeneration. It is thought that because of their atrophy, out of all proportion to other tissues, the thymus, testicles, ovary, and spleen provide a reserve of accessory food factors for use on occasion of metabolic stress, but this reserve is rapidly exhausted. Finally, although deficiency of certain accessory food factors is the essential ætiological factor in the genesis of beri-beri, Colonel McCarrison holds that infectious and parasitic agencies may often be important causes determining the onset of the symptoms of that disease. Vitamine deficiency renders the body very liable to be overrun by the rank growth of bacteria, and it is probable that varying metabolic disturbances may determine the character of these growths. We are glad to learn that Colonel McCarrison proposes to continue his investigations on this most interesting subject, and that he promises shortly another contribution dealing with the effects of a deficiency of accessory food factors on the function of the thyroid gland, with a histological study of 69 pairs of thyroids removed in the course of his experiments on pigeons and other animals fed on a polished rice dietary.

NATIONAL CONFERENCE ON INFANT WELFARE.

COMMENCING on July 1st, the League for Health, Maternity, and Child Welfare held at the Kingsway Hall a three days' conference, in which child welfare in all its aspects was discussed. The proceedings were opened on the first day by Dr. CHRISTOPHER ADDISON, M.P., who outlined the objects of the conference.

The first paper was read by Dr. AMAND ROUTH (consulting obstetric physician to Charing Cross Hospital) and was entitled—

Causes of Antenatal, Natal, and Neonatal Mortality.

He said that the conference would that day discuss how to save the lives and ensure the health of babies, considering the question from the very beginning of life, from the moment of fertilisation to the end of the first month after birth. The natural increase of the population had for the first time in our statistical history ceased, for during the six months ending March 31st last the deaths in England and Wales had exceeded the births by 126,445. The approximate percentage causation of antenal, natal, and neonatal deaths could be given as follows with fair accuracy: prematurity, 10 per cent.; syphilis, 20 per cent.; toxæmia, 10 per cent.; prolonged, difficult, or complicated labour, including antepartum hæmorrhage, 25 per cent.; other known causes, 10 per cent.; and "unknown" causes, 25 per cent. The fact that so large a percentage of the causes of antenatal death was "unknown" showed how much research and pathological team-work was still required.

The following table gives an estimate of the probable loss of life between fertilisation of the ovum and the end of the first year of life:—

Antenatal and Infantile Death-rates per 1000 Births of Children of Married and Unmarried Women, including "Natal" Deaths, Based on the Figures for England and Wales in 1917.

	Married.	Unmarried.
Antenatal.		
In latter 12 weeks	30	60
In former 28 weeks (estimated)	120 = 150	240 = 300
Infantile.		
Neonatal (first month)	37	72
Remainder of first year	59 = 96	135 = 207
Estimated deaths of children per 1000 births between conception and end of first year of life.	246	507

Note.—The actual deaths of mothers per 1000 births from causes connected with pregnancy and labour were: Married, 3·7; unmarried, 6·79.

It was evident, therefore, that the unmarried mother and her child needed the care of the State twice as much as the married woman if they were to be saved from this double rate of mortality and morbidity.

At the conference held last year Dr. J. W. Ballantyne wisely advised that the labour group of cases should be called distinctively "natal" or "intranatal," and he further suggested that the mortality of this period should be considered separately, for not only does it include all the operations needed to save the child in cases where there is a disproportion between the child and the maternal pelvis, but all the other complications of childbirth, such as maternal hæmorrhage, pelvic tumours, fœtal malpresentations, and pressure on the umbilical cord. Many malnourished, diseased, malformed, and premature children who fail to survive their birth would also belong to this group.

At the same meeting of the conference Dr. Ballantyne suggested that the first month after labour should be designated "neonatal," and the phrase is now generally adopted. It is known that the deaths of this neonatal period include 37 per 1000 births of the children of married mothers, and 72 per 1000 births of unmarried mothers, or about a third of those who die in their first year of life. These early infantile deaths comprise (1) feeble, malnourished or premature children who survive their births, 50 per cent. of whom die in the first 24 hours of life; (2) diseased children, such as those born syphilitic; (3) abnormal or deformed children, such as those born with hydrocephalus, spina bifida, ventral hernia, or encephalocele; (4) many children who may survive some weeks but who cannot suck owing to prematurity, cleft palate, hare-lip, or "snuffles." This "neonatal" period not only includes the risks to the premature or diseased child which occur in the

first few days of life, but also includes a period when the obstetrician (medical practitioner or midwife) has ceased to attend and the pediatrician or infant-welfare doctor takes on the case of the child, while the gynæcologist perhaps is required for the mother.

Premature births are so called if they occur before the thirty-eighth week of gestation. The causation of prematurity has not been satisfactorily worked out, but is often due to antepartum hæmorrhage, toxæmia, or undue physical effort or mental strain in the mother, or to malnutrition or morbidity in the child, which conditions should be therefore viewed as the primary causes of the fœtal death rather than the resulting prematurity at birth.

Amongst the main causes of death in both early and late pregnancy is venereal disease. Gonorrhœa is very rarely the cause of antenatal disease or death. Syphilis is estimated to cause at least 20 per cent. of the antenatal and neonatal deaths, and, if so, it would mean that about 27,000 deaths would thus result in England and Wales.[1] Stillbirths from antenatal syphilis in unmarried women are about double such deaths in legitimate pregnancies. Maternal toxæmia causes from 10 to 15 per cent. of fœtal deaths. These toxæmias are said to occur in 5 per cent. of primigravidæ, and are still more frequent in unmarried women who have to endure much more mental strain during their pregnancies. Accidents and complications of childbirth constitute the largest group of antenatal and neonatal deaths. Pelvic contractions, or tumours, or fœtal malpresentations are not only dangerous to the mother if the condition is recognised first during labour, but are still more dangerous to the child, who may have to be sacrificed to save the mother, for obviously if the mother cannot be delivered the mother and child would die. Maternal hæmorrhages, such as those due to placenta prævia and accidental hæmorrhage, especially the concealed variety, are the most fatal of all complications if not treated promptly. There are other occasional maternal causes of fœtal disease or death which could often be successfully treated if detected during pregnancy. He would only mention heart disease, Bright's disease, lead poisoning, malignant disease, acute specific exanthemata, pneumonia, and other acute and chronic lung conditions.

Dr. EARDLEY HOLLAND then read a paper on the Results to be Expected from Antenatal Care, which we print in full in another column.

Dr. J. J. BUCHAN (medical officer of health, Bradford) followed on the subject of

Antenatal and Neonatal Mortality.

He said: All those who have followed closely during the past 20 years the campaign in this country for the reduction of infantile mortality will have been struck with the varying phases of the movement and the great number of subjects investigated in relation to it. We have learned much in this time of the many factors that influence the health of the infant after birth and much good work has been done to reduce infantile mortality in the later months of the first year of life, but the field of knowledge of the conditions before birth affecting the welfare of the child when born is almost unbroken. We have hardly any accurate facts of antenatal or neonatal mortality; we cannot state with any degree of reasonable certainty the extent, the causes, or the steps to be taken to effect a reduction.

From the published figures of the Registrar-General it would seem clear that about 12 per cent. of the infantile mortality occurs before the infant is a day old and about 25 per cent. before it is a week old, and from 35 to 40 per cent. before it is a month old. If to these babies born living who died almost immediately the babies born dead are added, the number of deaths due to antenatal and neonatal causes is large indeed.

It would be well, without going further, to insist for the moment on the importance of increasing our avenues of knowledge so that these deaths may be more carefully investigated. Stillbirths are not recognised by the law for registration purposes, a great many do not come under the Notification of Births Act, and without doubt numerous others which should come under this Act escape notification. The blind position of the law, which only recognises life as commencing after birth, is responsible to a great extent for the lesser importance with which these births are regarded, and while from its own point of view the legal position is a reasonable one some means should be devised to bring all stillbirths and miscarriages, certainly after quickening, before the notice of the health authority in the interests of infant life. The Notification of Births Act requires the notification of a stillbirth occurring after the twenty-eighth week of pregnancy. Anyone who has followed the administration of the Midwives Act will be struck by the apparently small proportion of stillbirths notified by midwives. This arises chiefly from the fact that stillbirths in midwives' cases occur largely among those cases for which they seek medical aid, so that the stillbirth is ultimately notified by the doctor and not by the midwife. Thus, in Bradford during the past three years, while the general rate of stillbirths notified was 4·6 per cent. of the births notified, the stillbirth-rate among doctors' notifications was 6·4 and among midwives' notifications 3·2 per cent. of births notified.

The causes of these deaths can be classified in two groups, those arising during the actual labour and those arising or existing during the pregnancy. Every improvement in the midwifery service of the country will tend to lessen materially the deaths arising from neonatal causes, but we have not yet seen any very vast improvement in the midwifery service of the country generally. Though the Midwives Act has now been in operation for many years, its full benefits are still to be enjoyed by the community, as the bona fide midwives still carry on large practices, and the general service of midwifery is not attracting those recently and well-trained women whose names have swelled the Midwives' Roll. In the towns of the North of England there is an average of 70 per cent. of the births attended by midwives, rising in some cases to over 90 per cent. The work these women are doing is of paramount importance to the mother and the child and to the whole community, and it is of the utmost importance that their ranks should be recruited from the best women trained in practical midwifery. In years gone by the inefficiency of particular midwives has been tolerated, especially in some of the worst districts of our large cities and towns, by the knowledge that if this inefficient midwife did not practise there no one else would. She was practising for a mere pittance, irregularly received, and she served to meet—badly as she did it—a public want.

Since the passing of the National Insurance Act, with the inauguration of maternity benefit, such circumstances have not been so frequent, but nevertheless I am afraid that in many districts they still do exist. A consideration of such circumstances as these has led to the inauguration of the municipal midwife, whose advent will probably do more for antenatal and neonatal mortality than has yet been done. At present, in the City of Bradford, we have 12 municipal midwives who are attending more than half the births attended by midwives in the city. Antenatal work has been constantly talked of these last few years but very little has been done anywhere. It is amazingly difficult work to develop; it is easy to start an antenatal centre and to set aside hours for consultation and the like, but this is not sufficient. Much has to be done to educate women as to the need for antenatal supervision and care, but I do not think that this is best, if at all, attained by a notification of pregnancy and the appearance of another supervisor of their health apart from their midwives and their doctors. It is necessary to enlist especially the midwife in the service of the antenatal authority. The midwife has been sought out by the expectant mother herself, and will have much more influence with her than anyone else. Midwives themselves have to be taught to appreciate the meaning and the importance of antenatal work, and they have to impress upon their clientèle the need for early booking of their confinement. The municipal midwife is required to see her patient very frequently before the birth and to seek the aid of the antenatal clinic on all occasions. A definite antenatal centre, though of very great importance in antenatal work, is relatively of less importance than a well-organised and educated midwifery service. Without such a service the work of the centre is set at nought. We have been feeling our way for the past few years to antenatal work, but as a result of experience I think it can be said that it is not much use to establish antenatal centres without sufficient means of getting into touch with the work to be done. Antenatal centres must work in close association with hospital accommodation for gynæcological and maternity cases, and they have to establish a very intimate coöperation with the means of treatment for venereal disease.

[1] THE LANCET, 1918, i., 45.

Miss OLIVE HAYDON (formerly sister, York-road Lying-in Hospital), in the absence of Dr. VERA FOLEY, then gave the conference the benefit of her experiences on the subject of

The Work of the Midwife in Relation to Antenatal and Neonatal Mortality.

The speaker began by emphasising: 1. The need of educating women in hygiene and mothercraft. 2. The high mortality during intra- and extra-uterine life due to preventable illness, and the insidiousness of the manifestations of diseases, such as syphilis, gonorrhœa, and the toxæmias of pregnancy. 3. The need for further research work into the cause of ante- and neo-natal mortality. 4. The difficulty of bearing and rearing healthy children in poverty-stricken homes by unfit parents.

Midwives, she went on, besides practising independently and as staff midwives in institutions, are working under medical supervision as health visitors, creche nurses, rescue workers, infant welfare superintendents. Personally, I think every midwife, when qualified, should practise her profession for at least a year before taking up other work. This would lead to a broader and more sympathetic attitude to those who are practising midwives. To do more efficient work the midwife needs progressive education on broad lines, better economic conditions that will allow her to take fewer cases, and devote full attention to each patient she attends—and a status and consideration commensurate with the importance of her work for maternity and child welfare.

In conclusion, Miss Haydon touched on the midwife's work *vis-à-vis* with the patient. It is, she said, mainly threefold—educative, preventive, and practical—and of these three perhaps the most important is the education of the expectant mother, the mother, and the baby. The education begins at booking; unfortunately, this is seldom before the sixth month. Much writing has already been done on what Professor Thomson has called "the docket" of the new-born child, and much is irremediable. But the normal rapid growth and development of a normal fœtus may be retarded or interrupted by the ill-health or excesses of the mother during the last three months; hence the need for forewarning help and continued careful observation for abnormal signs and symptoms, so as to secure early medical treatment for physiological breakdown or infection. The former history, the general condition, and the physical examination of the patient should guide the midwife in dealing with the patient and help her to form an opinion as to whether it is advisable in the interests of the mother and unborn child to be attended by her. The midwife will receive with caution and some inward scepticism the explanation of the causes of previous miscarriages; she knows that thousands are attributed to shocks and falls, a very few to albuminuria, syphilis, &c., and still fewer to the taking of noxious drugs and drastic purges. She ought not to be content that a series of miscarriages should be attributed to those refuges of the destitute "habit" and "a weak inside." She may even dare to inspire with optimism the woman who has been told she would never carry a child to full term. The careful examination of the breasts and nipples begins the education on the value of breast-feeding; careful investigation into the causes that led to its abandonment with previous children forewarn and forearm the midwife. If it has been given up because the mother has had to go to work, there is always hope that she may be convinced that her primary duty is not washing or charing, or any other work in the labour market, but the persistence in breast-feeding. With an eight-hourly working day, and four-hourly feeding, there should now be fewer children fed from tins or poisoned slowly with contaminated milk, deprived of its accessory growth products by sterilisation.

The midwife is shrewd enough to know that faulty mothercraft, poverty, the health and character of the parents, bad hygienic surroundings are far greater factors in antenatal and neonatal mortality than hard work, smoke-laden atmosphere, bad midwifery, or even those plagues of the midwife's life—the "born before arrivals." A midwife's judgment of the character and capacity of the mother and home life is by no means to be despised; she has unique opportunities of studying these in her repeated and welcomed visits to the home.

Miss M. BURNSIDE, O.B.E., inspector of midwives and county health visitor, Hertfordshire County Council, then spoke on the work of the midwife in relation to antenatal and neonatal mortality in rural districts.

The afternoon session on July 2nd was given up to a discussion on Industrial Employment of Mothers in Relation to Infant Mortality, when the speakers were Dr. Rhoda Adamson, clinical lecturer in obstetrics at the University of Leeds, Miss L. Barker, of the Training Department, Ministry of Labour, and Mrs. Holden, of Dewsbury. Both sessions on July 3rd were occupied in discussing the subject of the Unmarried Mother and the Unwanted Child.

AMERICAN MEDICAL ASSOCIATION: ANNUAL MEETING.

THE Seventieth Annual Meeting of the American Medical Association was held in Atlantic City from June 9th to 13th. The first day was taken up with business matters by the House of Delegates.

Report on Medical Education.

Among other questions of interest Dr. JOHN A. DODSON, of Chicago, submitted the report of the Council on Medical Education. A fact in this report worthy of emphasis was that of the 20,678 students who graduated during the past six years 15,025, or 72·6 per cent., were admitted under the higher entrance requirements, and received their training in the Class A medical schools.

Report on Social Insurance.

Dr. ALEXANDER LAMBERT, of New York, submitted the supplementary report of the subcommittee on social insurance. He stated that during the years 1915, 1916, and 1917 the committee had inquired extensively into the question of whether there was a sickness problem, what it was, and how it was to be met. The findings were that 2·6 per cent. of the population were seriously sick all the time, 1·5 per cent. were more or less disabled, and that among the 38,000,000 employees in the United States there was an average of nine days' illness per man per year. In figures about $500,000,000 (£100,000,000) a year would represent the loss in wages by the wage-earners from sickness. The amount of sickness in a family was found to vary inversely as the wages of the family; also the sickness rate was higher in proportion as the number in the family increased. In well-to-do families the infant mortality-rate in America averaged 41 per 1000 births, while among the poor it averaged 225 per 1000 births. Only 25 per cent. of pregnant women received anything like adequate antenatal care. In Philadelphia 60 per cent. of the sick poor had only home care, and patent medicines were found to be used by from 25 to 50 per cent. of these persons. In about 35 per cent. of the cases the wage-earners had sickness insurance amounting to 10 or 15 per cent. of the wages; some carried a voluntary insurance, but the larger proportion had no insurance at all against sickness.

The report considered the question of sickness insurance, and after pointing out that general insurance schemes in Germany and England had not been found to work well, the opinion was stated that a solution must be found through the organised aid of the medical profession with the help of the State and county medical societies. The medical profession should decide whether better protection against sickness could be obtained through the increase of State Health Department control, or whether it should be sought, as in England, through a pro rata per man per year fund.

Distinguished Guests.

The meeting proper began on Tuesday, June 10th. A feature of the meeting was the presence of a number of foreign guests. Among these were Mr. Ernest W. Hey Groves, Sir StClair Thomson, Major-General Sir Bertrand Dawson, Sir Shirley Murphy, Sir W. Arbuthnot Lane, Sir Arthur Newsholme, Colonel Sir W. T. Lister, and others, including representatives from France, Belgium, Greece, Norway, Sweden, Cuba, and Japan.

The Presidential Address.

Dr. ALEXANDER LAMBERT, the President-elect, delivered the presidential address on Medicine, a Determining Factor in War. He pointed out the success of preventive medicine in the war just over. As for the lessons learned in determining action in future, Dr. Lambert thought that the experience of the last war and the history of recent wars had shown clearly that only through proper

representation on the general staff of armies by those men trained in the methods of salvage and by experts in sanitation could these duties be efficiently performed. The final paragraph of the address discussed the national control of preventable diseases. The war had taught that there remained economic value in the maimed and wounded, and it was the duty of the State to develop this value to the fullest extent. The maiming and injury of workers in the everyday work of industry far exceeded each year the battle casualties of this war, and there was an economic necessity and duty to be performed in the salvage and reconstruction of the industrially injured. The President ended an eloquent address by urging that it was the duty of the American Medical Association and of each member of each State association to press on Congress the need for the establishment of a National Department of Health.

Health of the United States Navy.

At the meeting which was held on the evening of Wednesday, June 11th, national organisations, the activities of each of which have a definite medical interest, were represented by speakers chosen by these organisations. Among these speakers was Commandant JAMES R. PHELPS, U.S.A., who spoke as the representative of Surgeon-General Braisted. He said that the death-rate for the first year of the war in the United States Navy was lower than for the previous year of peace. The rate was 8·8 per 1000, the lowest ever reached by the naval or military service at war.

The Public Health Service.

Dr. C. C. PIERCE, of the United States Public Health Service, spoke as the representative of Surgeon-General Blue, and outlined briefly the activities of the Public Health Service in connexion with the war.

The American College of Surgeons.

Dr. FRANKLIN MARTIN, as the representative of the American College of Surgeons, spoke of the organisation of that body, which had been patterned after the Royal College of Surgeons of England. They had now a membership of 4000 in the United States and 400 in Canada.

War Surgery and the Surgery of Civil Life.

In the Section of Surgery, General and Abdominal, Dr. JOHN J. BOTTOMLEY, of Boston, the chairman, discussed briefly the influence of the surgery of the great war on the surgery of civil life. He pointed out that no entirely new surgical principle was discovered during the war, but in this fact there was no discredit to surgery since the long-established principles upon which it rested had emerged triumphant from a tremendous test. At no period of the war were the principles of asepsis and antisepsis in danger; their practice, however, was at first rudely shaken because of the novelty of military conditions. Dr. Bottomley then dealt with the accomplishments of recent military surgery in their relation to civil practice. It had been demonstrated, he said, that even in severe wounds, with existing contamination, infection could be prevented or controlled. Tetanus had practically been banished because of the preventive property of the antitoxin. Treatment by magnesium sulphate and carbolic acid had been definitely put aside. The wound conditions favouring the development of gas gangrene were recognised, its pathology was known, and the earliest signs of its presence were tabulated, and consequently its treatment was now on a more scientific and successful basis. There were promising indications that an effective antitoxin for it might be developed. There was no longer any question as to the proper treatment either in peace or war of penetrating wounds of the abdomen. The contention of the civilian surgeon had been upheld. Many of our doubts as to chest surgery had been dispelled. The need for complicated pressure apparatus had gone with the establishment of the fact that without it the pleural cavity might be opened freely and the lung handled without special danger. Convincing evidence had established beyond doubt the position of those who in pre-war days asserted that synovial membrane had strong powers of resistance to infection, and that drainage of joints recently wounded was not only unnecessary but often harmful. The factors entering into the production of shock and the details of its treatment had been so vividly delineated that no surgeon who had to do with the great industries in which severe injuries were common could afford to neglect provision for the prompt and efficacious treatment of the shock that might accompany them. The treatment of fractures had been stabilised by the standardisation of splints and other apparatus for immobilisation, which had largely supplanted the use of plaster-of-Paris.

Influenza in the A.E.F.

Among the instructive papers read was one surveying the epidemic of influenza in the American Expeditionary Force, by Dr. WARFIELD I. LONGCOPE, of New York.

Malaria Treated by Disinfection.

Another paper which attracted a good deal of attention was that by Dr. C. C. BASS, of New Orleans, dealing with the effective and practical treatment of malaria by disinfecting infected persons. From 50 to 68 per cent. of the malaria occurring in a representative malarial locality of the United States was relapse and not new infection. The chief cause of ineffective treatment was the employment of spectacular and unpractical methods. The discomfort and inconvenience of quinine in solution was referred to as an example of improper and unpractical methods of treatment. Blood examination could not be depended upon to determine when disinfection had been accomplished. The only trustworthy guide was the length of time proper quinine treatment had been kept up. An effective method of treatment was to administer ten grains of quinine sulphate every night before retiring for a period of eight weeks. This was effective in about 90 per cent. of cases.

War Hysteria.

In the Section on Nervous and Mental Diseases Dr. TOM A. WILLIAMS, of Washington, D.C., read a paper on the Management of War Hysteria. He said that most patients could be restored immediately if skilfully treated, but differentiation must be made between cerebral commotion and chronic emotivity. Cardiac fatigue in hysterical subjects often suggested the long-continued incapacity which might manifest itself as an effort syndrome. In a majority of cases collective suggestion was an important feature of treatment, but in a more complex case individual analysis was essential. The methods most generally and successfully used had been: 1. Direct suggestion in the early stages at the front. 2. Indirect suggestion and persuasion, often combined with torpillage or other uncomfortable applications or by isolation. 3. Best of all, however, a metamorphosis of the patient's mental attitude by re-educative procedure as well as by collective suggestion.

The Pituitary Gland in Epilepsy.

In the same section Dr. BEVERLEY R. TUCKER, of Richmond, Va., in a paper on the Rôle of the Pituitary Gland in Epilepsy, said that he believed that convulsions, whether pathological and called epilepsy or otherwise, were symptoms of underlying diseased conditions, and therefore were organic and not functional. Among these underlying conditions was a secretion of the pituitary gland. He agreed with Cushing that the pituitary secretion gave a substance which had to do with cortical cell stability, and that when the secretion was diminished or absent convulsions might ensue. Hypopituitarism was divided into two types: first, the congenital or chronic type, in which the patient gave evidence in the past of the usual syndrome of the hypopituitarism, and might have convulsions as he approached adolescence. The second or transitional type might present clinical evidence of normal or even hyperpituitary secretion in the past, but as adolescence approached diminished secretion was shown by lack of perspiration, increase in fat, increased sugar tolerance, slowed pulse, lowered blood pressure, and at times convulsions. The radiographic findings in the cases reported confirmed the clinical observations. The first type showed a small fossa with enlarged processes and roughened sella, and the second type enlarged fossa with large processes and roughened sella. These bony outgrowths encroached on the fossæ. A number of cases were reported and the satisfactory result of pituitary feeding was shown.

The Therapeutic Aspect of Blood Tranfusion.

In the Section of Pharmacology and Therapeutics Dr. LESTER UNGER, of New York, spoke on the Therapeutic Aspect of Blood Transfusion, and referred to the respective merits and indications of transfusion with unmodified blood and with citrated blood. The technique of the method devised by the author was explained, as well as the microscopic method of testing the compatibility of the donor's and recipient's blood.

Alcoholic Liquors in Relation to Health.

Dr. LAMBERT OTT, of Philadelphia, discussed the question of light wines and beer in relation to health, and said that after 40 years of observance among wine, beer, and whisky drinkers he had come to the conclusion that the use of light wines and beer was healthful, and he thought that their sale under Federal and State supervision should be continued. He was of the opinion, however, that the sale should be closely supervised to see that no ingredients were used as preservatives which would be harmful.

CONTROL OF VENEREAL DISEASE.

Provision of Treatment Centres.

SPEAKING to the Local Government Board vote in the House of Commons on June 30th, Dr. Addison suggested that the work of the 146 existing centres was good but susceptible of improvement, while at least 1000 such centres would be needed. Organisation of these centres and training of the expert personnel were a matter of time, and increase in efficiency could not be other than gradual. Compulsory notification before efficient treatment had been organised substantially throughout the country would, he thought, drive patients into the hands of inexperts and quacks. The numbers in attendance at the treatment centres approached half a million in 1918, having been barely over 200,000 in the previous year.

Compulsory Notification.

The subject of compulsory notification of venereal diseases continues to receive attention. Committees have sat on it, commissions have considered it, correspondents to the daily press have commented upon it, lecturers have enunciated their views upon it. It is time to arrive at a decision as to the desirability of initiating some scheme of notification, so that if the verdict be affirmative that scheme may be put into practice at once, or, if negative, our energies may be concentrated on other methods for the protection of society. In general we believe opinion to be in favour of a system of notification, if thereby a larger number of patients were brought under early treatment. The paramount objection advanced is the fear of deterring patients from seeking qualified treatment if they knew that this involved notification. If an unsuitable plan was put into operation there would, it is true, be reason to fear such a result. Experience in America and Australia, however, points to an efficient method to which no objection can be taken. The February issue of *National Health* enunciates the main features of the American scheme:—

The physician in the city of Chicago, as an instance, notifies the Public Health Department of Case "A," whom he is treating for syphilis. The Department registers the case with an identification number—e.g., Case 5000—and sends to the doctor literature, each leaflet of which is stamped with the patient's registered number, to hand on to him. The patient is urged to pay great attention to the instructions, which are of an educational, not a remedial, nature. If he desires for any reason to change his physician, all that will be necessary for him to do is to report his registered number to the next physician who takes up the case. He is informed that provided he continues treatment till pronounced cured, and observes the necessary precautions to prevent spreading infection, the State is satisfied, but if he fails to observe these requirements his identity will be disclosed by the physician to the Public Health Department, which will then take proceedings.

The gist of this scheme was laid before the Commission on Birth Control by Miss Norah March on June 13th, and was in harmony with the trenchant letter to the *Times* of April 5th over the signatures of Sir William Osler, Dr. Eric Pritchard, Sir William Hale White Sir G. L. Cheatle, Mr. W. H. Clayton-Greene, and Sir James Purves Stewart. As a result of the activities of the Local Government Board in opening treatment centres, of the admirable propaganda work of the National Council and its branches, and last, but not least, the information, interest, and fears which are filtering through the various social strata, the demand is undoubtedly increasing for some form of "Government action" directed towards the repression of venereal disease. Altruism and Parliamentary expediency for once are in unison and call for an immediate constructive policy. The method of notification adopted at first may not be perfect, but if elastically contrived now it can later be modified by experience. To reduce what opposition may still linger two courses are open. Firstly, to inform large corporate bodies, representative of the industrial classes, of the innate meaning and powers for good of the scheme to be adopted. Their sympathetic interest, thus gained, should influence or compel acceptance of the scheme by their nominees. Secondly, to lay before the medical profession a concise and systematic statement of the proposed scheme in all its bearings. This would reach many who are prevented by time or distance from attending meetings or conferences. Where possible addresses should be given enabling the practitioner to answer objections encountered in the course of his professional work.

Prophylaxis v. Early Treatment.

Controversy still centres round the epoch at which disinfection of venereal contact is admissible. Certain obvious facts are apt to be overlooked. Whilst those who oppose earnestly the issue of prophylactic packets for fear that such facilities may tempt the fearful to plunge into venery, they are apparently forgetful of one pertinent fact. All their arguments against the use of packets are effectively advertising the existence of the very articles they refuse to sanction and are playing into the hands of the dealer in so-called rubber goods and the unscrupulous druggists, who, without actually infringing the Venereal Disease Act, are bringing these articles more and more prominently to the notice of the public. These facts must be understood and then faced.

Nothing but good can come of the frank public discussion at the Guildhall Conference of the Royal Institute of Public Health on June 25th, of which we published a long summary last week. Sir Malcolm Morris, preferring not to enter into the ethical side of the question, described prophylaxis as a panicky measure. Dr. J. H. Sequeira admitted that his opinion in regard to prophylaxis had changed after seeing important results follow from it at the treatment centre of which he was in charge. He was himself unable to differentiate ethically between supplying a man with a prophylactic outfit and giving him an address to which he could go for so-called early disinfection. Sir Thomas Barlow, whilst deprecating the issue of packets, called attention to the value of a 2 per cent. solution of ordinary yellow soap in destroying the gonococcus. It may usefully be recalled that the prophylaxis at birth of gonorrhœal ophthalmia has been practised with conspicuous benefit for many years.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A League against Cancer.

A VAST international league has just been initiated in Paris, largely owing to the efforts of Professor Hartmann, to deal with all aspects of the cancer problem—research, study of preventive means, and treatment. It bears the name of Franco-Anglo-American League against Cancer. Patrons are: Lord Bertie of Thame, the British Ambassador in Paris; Mr. William Sharp, late U.S.A. Ambassador; M. Mesureur, director of the Assistance Publique in Paris; Dr. Roux, director of the Pasteur Institute; Professor Roger, doyen of the Faculty of Medicine; and M. Leclainche, inspector-general of veterinary services. The administrative council is made up as follows:—

President: M. Justin Godart, late Under-Secretary of State for the Service de Santé.

Vice Presidents: Professor Hartmann, professor of clinical surgery in the Faculty of Medicine; Sir John Pilter, honorary president, British Chamber of Commerce; Professor Mark Baldwin, corresponding member of the Institute of France; Baron Edouard de Rothschild. *Other Members:* Mr. Laurence Banet, Mr. Walter Berry (President of the U.S.A. Chamber of Commerce), Professor Borrel, Dr. Branch, Dr. Cunéo, Professor Depage, Dr. Dubrujeaud, Dr. Helme, Major Lambert, Augustin Lumière, Professor Regaud, Professor Roger, Dr. Henri de Rothschild, Dr. Shoninger, M. Felix Vernes, M. François de Wendel (deputy). Treasurer: M. Deharme. Legal Advisers: M. Boccon-Gibod, solicitor; M. Chavanne, notary. *Scientific Committee:* Professor Roger, Professor Achard, Professor J. L. Faure, Professor Gilbert, Professor Hartmann, Professor Letulle, Professor Ménétrier (Member of the Academy of Medicine), Professor Borrel (head of the cancer laboratory of the Pasteur Institute), Professor Regaud (head of the biological laboratory of the Radium Institute), Professor Bérard and Professor Paviot (Lyons), Dr. Calmette (Lille), Professor Chavannaz (Bordeaux), Professor Forgue (Montpellier), Professor Depage and Professor Dustin (Brussels). Committee of patronesses with the Dowager Duchesse d'Uzès in France and Lady Derby in England at its head. *General Secretary:* M. Robert Le Bret, 2, Avenue Marceau, Paris. Assistant Secretary: Mme. (Dr.) Fabre.

A circular has been addressed to all the medical men in France calling attention to the fact that cancer claims more than 33,000 victims a year in France, and last year claimed 3420 in Paris alone. The circular insists on the benefits of early surgical interference, which gives, at the end of five years, an immunity from relapse amounting to 50 per cent. where the breast is concerned, 59 per cent. for the cervix uteri, 35 per cent. for the stomach, and 45 per cent. for the rectum. The attention of medical practitioners is called to the importance of noting the slight early signs of cancer, and these are described minutely under the various topographical headings. A questionnaire is sent out, replies to which are to form the basis of a vast inquiry, leading to a system of rational prophylaxis.

1. Is cancer frequent or not in the region where you practise? In your experience what is the cause of this frequency or relative immunity—heredity, habitat, manner of life, &c.? From the point of view of age has the date of onset of cancer been lowered?

2. Is cancer on the increase amongst your patients; if so, since when? Has this rate of increase been greater during the war? Have you observed cases of cancer occurring at the same time in husband and wife? Have you noted the existence of cancer in people dwelling together or successively in a certain house?

Medical War Benefit.

The medical benefit fund is a section of the General Association of the Doctors of France concerned with collecting subscriptions to found a relief fund for doctors and their families in difficult circumstances owing to the war. More than a million francs has already been collected in voluntary donations from the medical profession in France and abroad. At the last general meeting, at which the Under Secretary of State for the Service de Santé presided, held in the large amphitheatre of the Faculty of Medicine, it was stated that frs. 900,000 had been distributed in aid of the practitioners in the devastated districts, of widows and orphans of medical men, and of students deprived of the necessary resources for pursuing their studies.

Stereoscopic Radioscopy.

Dr. Chabry has devised a simple and ingenious method of examining radiograms in the stereoscope to produce a striking effect of relief. Two plates having been taken at a different angle they are reduced to stereoscope dimensions and placed side by side on the same slide. The first plate is then reproduced again on the far side of the second, giving three pictures side by side on the same slide. The slide thus prepared is placed in the stereoscope, when plates 1 and 2 give a fine relief of the anterior surface, and plates 2 and 3 the same relief of the posterior surface. By this manœuvre it is claimed that a perfect localisation is obtained, and as the dimensions of the slides are small a valuable documentary collection can be made in a small space.

July 5th.

URBAN VITAL STATISTICS.

(Week ended July 5th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had been 9·9, 10·0, and 9·6 per 1000 in the three preceding weeks, rose to 10·0 per 1000. In London, with a population slightly exceeding 4,000,000 persons the annual rate was also 10·0, against 9·0 per 1000 in the previous week, while among the remaining towns the rates ranged from 2·9 in Carlisle, 3·8 in Gloucester, and 4·4 in Newport (Mon.), to 15·7 in Oxford, 16·1 in Hastings, and 16·9 in Wigan. The principal epidemic diseases caused 153 deaths, which corresponded to an annual rate of 0·5 per 1000, and included 49 from infantile diarrhœa, 40 from diphtheria, 29 from measles, 15 each from scarlet fever and whooping-cough, and 5 from enteric fever. Measles caused a death-rate of 1·4 in Newcastle-on-Tyne and 1·5 in Warrington. There were 2 cases of small-pox, 1236 of scarlet fever, and 990 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2, 1143, and 1030 respectively at the end of the previous week. The causes of 18 deaths in the 96 towns were uncertified, of which 5 were registered in Birmingham, 3 in Liverpool, and 2 in Warrington.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had been 12·4, 11·0, and 11·5 per 1000 in the three preceding weeks, fell to 9·9 per 1000. The 213 deaths in Glasgow corresponded to an annual rate of 9·9 per 1000, and included 5 from whooping-cough, 4 from measles, 3 from infantile diarrhœa, and 1 from diphtheria. The 69 deaths in Edinburgh were equal to a rate of 10·7 per 1000, and included 6 from measles, 2 from whooping-cough, and 1 from infantile diarrhœa.

Irish Towns.—The 99 deaths in Dublin corresponded to an annual rate of 12·7, or 1·1 per 1000 below that recorded in the previous week, and included 2 from infantile diarrhœa and 1 from diphtheria. The 87 deaths in Belfast were equal to a rate of 11·3 per 1000, and included 2 from scarlet fever and 1 from infantile diarrhœa.

Obituary.

RICHARD DANCER PUREFOY, M.D., LL.D. (HON. CAUSÂ) DUB.,

PAST PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND; PAST PRESIDENT OF THE ROYAL ACADEMY OF MEDICINE IN IRELAND; PAST MASTER OF THE ROTUNDA HOSPITAL.

Dr. R. D. Purefoy died at his residence in Dublin on June 27th, in his seventy-second year, after a brief illness. His friends had noticed for some time that his health was failing, but it was not until a month or two ago that he admitted any loss of vigour. Early in June he went to Newcastle, co. Down, for a holiday, but he felt so ill that he came home in a few days. He was carried to his bed and gradually sank to rest.

Richard Purefoy came of a medical family, his father practising as a doctor at Lucan, a few miles from Dublin. His mother was a native of Tipperary, and it was in that county that he was born. Educated at Raphoe School, co. Donegal, and Trinity College, Dublin, Purefoy took his medical degrees in 1872. In 1879 he became a Fellow of the Royal College of Surgeons in Ireland. From the first he devoted himself to the obstetric art, and was successively assistant master at the Coombe and at the Rotunda hospitals. In the latter he worked under Lombe Atthill and George Johnston. He was for many years gynæcologist to the Adelaide Hospital, and in 1896 he returned to the Rotunda as Master. When his term of mastership was ended he was elected consulting gynæcologist to the hospital. He signalised the termination of his office by presenting to the hospital a fully equipped clinical laboratory. For many years he was very busy in practice, and for a generation he was one of the leading obstetricians and gynæcologists in Ireland. In 1912, after many years' service as a member of Council, he was unanimously elected President of the Royal College of Surgeons, being the first of his specialty to occupy the chair since 1880, when McClintock was President. It was during his tenure of office as President that Purefoy received the honorary degree of LL.D. from the University of Dublin at the Bicentenary celebrations in 1912. In 1915 he was elected President of the Royal Academy of Medicine.

By Purefoy none of the many posts of honour he held were regarded as sinecures. He fulfilled their duties in most exact manner. The Rotunda Hospital was, however, his chief interest in life. No governor in the history of that great charity ever held it in closer affection or devoted more time and energy to its welfare. Outside his professional work Dr. Purefoy was interested in music and art. Possessed of a baritone voice of good quality, in his younger days he sang in the choir of Trinity College Chapel, and all his life he was a member of many of the musical clubs in Dublin. At the time of his death he was President of a very ancient musical society—the Hibernian Catch Club, and he also collected pictures, glass, and furniture. In private a generous but keen student of life, few men of his age kept up so much interest in the advance of knowledge. Masterful in his individuality, he did not bear opposition easily, and while no one could be a better friend he was frank in his dislikes. His disappearance leaves a gap in the professional and social life of Dublin, where he was for so long a characteristic and prominent figure.

ALEXANDER SCOTT, M.D. GLASG.,

CERTIFYING FACTORY SURGEON, SOUTH-EAST GLASGOW AND TOLLCROSS.

THE death of Dr. A. Scott brings a strong sense of personal loss to medical men in the West of Scotland as well as to many employers and workers of industrial Glasgow. His original choice was the Ministry and his first work was teaching, but the very practical nature of his sympathy with workers attracted him to the practice of medicine. In 1875 he qualified M.B., C.M. in the University of Glasgow and took the M.D. degree 12 years later. Early in his medical career he focussed his attention on industrial disease, and his numerous contributions to the literature of this subject bear evidence alike to his medical acuteness and to his deep interest in the workers' welfare.

The recognition of this work by his colleagues and by the Home Office was to him not only a source of honest pride and satisfaction but also an inspiration and encouragement to

persevere. Many medical teachers and practitioners can recall valuable advice and help freely and generously given. As certifying factory surgeon he had many opportunities of investigating industrial conditions, and of these he made full use not only as a clinician but also as a sociologist, for his mind was too broad and his sympathy too deep to be fettered by the limits of his official duties. Employers and workers alike remember countless acts of unostentatious help for those handicapped in life by physical defect. A typical instance may be mentioned as an illustration. A medical friend showed Dr. Scott one of the early cases of cerebro-spinal fever in 1905—a boy who recovered but with total deafness. Six years later, when the boy was ready to leave the Deaf-Mute School, the parents were surprised to find that Dr. Scott had secured for him a situation in a drawing office, where he could learn a profession in which his deafness was no bar to progress. In spite of all his numerous and varied duties, he had never forgotten the wasted figure of the meningitic boy; and without any hint or application from outside, he had taken charge of the lad's future in his own quiet unobtrusive way.

To those who knew him this active practical sympathy explained much in his nature besides accounting for his reputation as a conscientious and safe medical referee, because it made him almost unduly sensitive to adverse or unsympathetic treatment. Actions that outsiders might attribute to personal pique were often only the natural expression of his resentment against a harshness of treatment entirely foreign to his own nature. A native of Ayrshire, he was at his best in Scottish song and story; and thousands have enjoyed the revelation of his strong personality in his popular lectures on these subjects. A sterling upright man in every relation of life, the city of Glasgow and the ranks of industrial medicine are consciously the poorer for his loss.

THE LATE DR. E. G. FEARNSIDES.

SUPPLEMENTING the biographical notices of Dr. E. G. Fearnsides, which appeared in our last week's issue, Dr. Henry Head writes:—

"The death of Dr. Fearnsides has left a gap in the ranks of the younger neurologists that cannot be filled. He possessed an unusually wide and accurate knowledge of the physiological aspects of medicine, especially neurology. His pride was to be familiar with every paper written by Gaskell and those who drew their inspiration from him; this made the review of the 'Innervation of the Bladder and Urethra' published by him in *Brain* (1917) so masterly an exposition of the work of the English school. He was the most devoted fellow-worker, and formed the coördinating member of the team working on syphilis of the nervous system at the London Hospital. No trouble was too great to perfect the records, for he had a genius for order and method, and every patient we examined was known to him personally and looked to him for help.

He showed the same self-sacrificing ardour in the service of the hospitals to which he was attached, and was always ready to take on his shoulders emergency duties without hope of reward. Out-patients have been known to weep when they heard that Dr. Fearnsides was no longer in charge. He was beloved by his patients, for in each case he constantly exalted the importance of the individual rather than the disease. This was the secret of his success at the Home of Recovery, Golders Green, subsequently transferred to the Royal Air Force as a hospital for officers suffering from functional nervous disorders. He will always be remembered by those who worked with him as a physician of wide interests and unbounded kindness of heart."

PRESENTATION TO DR. MICHAEL GRABHAM.—Dr. Michael Grabham, F.R.C.P., of Madeira, has been the recipient of an illuminated address enclosed in a silver casket, from the British community, in acknowledgment of long and unwearying medical and general public service. Dr. Grabham, a most hospitable virtuoso, received on the occasion more than a hundred guests, to whom he displayed the interesting collection of scientific instruments, china, and silver, which have accumulated in his ancient Quinta; and in responding to the presentation gave a review of medical progress since his early days, and a recital on his magnificent organ, recalling to some of those present his past refined manipulation of the giant instrument in St. Paul's Cathedral. Dr. Grabham was an intimate friend of Thomas Wakley, the eldest, the Founder of this journal, whom he accompanied to Madeira on a search for health.

Correspondence.

"Audi alteram partem."

PORTRAIT OF SIR CLIFFORD ALLBUTT.

To the Editor of THE LANCET.

SIR,—The large number of subscribers to the Fund for presenting Sir Clifford Allbutt with his portrait has proved that the profession welcomes the opportunity of testifying to the esteem and affection with which he is regarded. Subscriptions have been received from nearly a thousand members of the profession. It had been intended to close the Fund at the end of June, but I have been asked to keep it open until July 31st. I would ask all those who wish to take part in the presentation, but have not yet notified their intention, to send their subscriptions, which must not exceed one guinea, without delay. Cheques and postal orders should be made payable to the "Sir Clifford Allbutt Presentation Fund," crossed London County, Westminster, and Parr's Bank, and addressed to the treasurer of the British Medical Association, 429, Strand, London, W.C. 2.

I may add that it is intended after the portrait in oils has been painted to commission a mezzotint engraving from it which subscribers to the Fund will be able to purchase for their own collections.—I am, Sir, yours faithfully,

G. E. HASLIP,
Treasurer.

July 7th, 1919.

DETOXICATED VACCINES.

To the Editor of THE LANCET.

SIR,—Dr. D. Thomson's article on this subject in your issue of June 28th raises many interesting points for bacteriologist and clinician alike. The fact that the toxic portion of a bacterium can be removed by treatment with alkalies, alcohol, &c., was noted by Vaughan and his co-workers in America some years ago in their work on the cleavage products of bacterial protoplasm. These researches, which extend over a period of nearly 20 years, were brought together in book form under the title of "Protein Split Products" shortly before the war. The book contains an immense amount of practical biochemical detail which I need not enter into, but it also contains the basis of the work on which the detoxicated vaccine must rest. The authors regard the bacterium as composed of relatively complex proteins which closely resemble those of the cells of the higher animals. They found that the cellular substances of bacteria yield cleavage products identical with those obtained by the hydrolysis of vegetable and animal proteins. In animals the toxin produced from the typhoid bacillus, from egg albumin, and from the hemp-seed kill laboratory animals in much the same way, and, as Vaughan points out, there is "striking evidence of the similarity in the structure of the protein molecule, whether it be of bacterial, animal, or vegetable origin." Vaughan devised large copper tanks which were capable of containing as much as 20 litres of agar, and by this means was able to produce enormous quantities of growth for his analyses. Elaborate precautions were taken to remove all traces of medium from the growth, and when this had been done some 60–80 g. of purified cellular substance remained from the growth in each tank. By acting upon the bacteria with a 2 per cent. alcoholic solution of caustic soda Vaughan was able to produce two distinct portions, a toxophor and a haptophor portion. Careful chemical analyses were made, and it was concluded from these that the toxophor element obtained from the different sources appeared to be the same, whereas the haptophor residue in each case differed from that obtained from other proteins. This haptophor residue when injected into guinea-pigs conferred immunity against the living organism (e.g., in the case of *B. coli*). Furthermore, this immunity was specific, and could not be produced by other proteins such as egg albumin, whereas in the case of the toxophor group there was apparently no specificity. Vaughan believes that this splitting of bacterial protein into two portions is carried out in the human body by a proteolytic ferment produced by certain cells, and that this ferment is specific for the protein which calls it into existence. A large number of organisms were investigated in this way—*B. typhosus*, *B. coli*, *B. anthracis*, *B. tuberculosis*, pneumococcus, and a number of saprophytic bacteria.

The results of this work are obviously of far-reaching importance. Not only are they, as has already been remarked, the basis of vaccine therapy, they are also intimately bound up with anaphylaxis, tubercular hypersensitiveness, pyrexia, and immunity problems generally. In tuberculosis especially there is a large field for research on these lines, and the authors appear to have utilised their opportunities to their full extent. They do not, however, record much in the way of clinical observation, and it is on these lines that the next step has to be taken. It seems possible that bacteria possess an external lipoidal substance soluble in fat solvents and that after this has been removed we have a protein base which can be divided, as Vaughan has shown, into two portions. At least three portions, therefore, may enter into the composition of the ordinary vaccine emulsion. It is far from unlikely there are others also, and the whole question affords a striking example—if such were needed—of how crude our methods have been in the past. The use of these newer methods in vaccine therapy on the one hand, and in the preparation of antigens for deviation of complement reactions on the other, warrants very careful clinical observation from independent observers. With such observations used as controls I believe that far-reaching results may be forthcoming.

I am, Sir, yours faithfully,

July 7th, 1919. S. ROODHOUSE GLOYNE.

EPIDEMIC PERINEPHRIC SUPPURATION.

To the Editor of THE LANCET.

SIR,—In connexion with the interesting correspondence upon this subject which has occupied a place in your recent numbers, it may be worth noting that during war service in the Mediterranean I saw an unusually large number of these cases as well as of perinephric inflammation which subsided without operation after rest in bed. These cases were very common in Malta in 1916 and the first half of 1917. There was, so far as I know, no influenza among the troops there, but boils and other cutaneous sores were extremely common. After the middle of 1917 I saw an unusually large number of such cases in France, but they were not, I think, in so great a proportion to the total sick as they were in Malta. The prognosis in both places was very good.

I am, Sir, yours faithfully,

WILLIAM THORBURN,
Late Consulting Surgeon, British Armies.

Manchester, July 6th, 1919.

THE MAINTENANCE OF COTTAGE HOSPITALS.

To the Editor of THE LANCET.

SIR,—There has been considerable correspondence in the medical and lay press as to the need for increased hospital accommodation, especially of the cottage hospital type. The difficulty in establishing these institutions is not so much the cost of building and equipping as the fear that exists that they will be a continued and increasing drain upon the charitable public. For this reason it is important to consider the question of maintenance; there is apparently a general agreement that this should be as little as possible dependent on charity.

Take the case of an auxiliary hospital with 20 beds serving a population of 10,000. One ward of five beds would be set aside for maternity cases. The upkeep of these beds might, under the Maternity and Child Welfare Act of last year, be provided, for the greater part, by the local authority; in so far as it might not be, the cost would be met by the patients occupying them, so that this ward at any rate would in no way be dependent on charity. Another section of the hospital would consist of separate private beds for patients willing to pay such fees as would not only cover the actual cost of their maintenance, but would allow a certain profit for the institution. The number of these beds would vary with the character of the population, perhaps 5 out of 20. This would be no charge on charity. There would remain ten ordinary hospital beds. Some of the patients occupying these beds might be able and willing to pay the necessary fees, but the majority would probably not be willing, or, if willing, would not themselves be able to pay. As yet we cannot look for these payments from the National Insurance Commission, Approved Societies, or local authorities, although the latter, under Section 131, Public Health Act, 1875, have the power to make them; but we may quite fairly point out to the public that the time cannot be very far distant when one or other of those authorities will be called upon to support these hospitals.

Public Hospital Funds.

The most business-like system is to pay for each patient admitted the actual amount of their cost to the institution. To do this it would be much better if the public, different bodies of workers, and other groups of persons, instead of paying hospitals indefinite sums, for which they expect an indefinite amount of treatment, would each form their own hospital fund, out of which they would pay for any patient that they sent to hospital the whole of the sum required. This would be a more business-like arrangement, more fair and satisfactory for all concerned. Those using the hospital would feel a greater sense of independence. There would be no differentiation between the patients, each of whom would bear, directly or indirectly, his fair share of the expenses of the hospital. Contributors would feel a more direct interest in the management of the institution and would probably appreciate more fully the benefits that they received.

If each society or group of persons had, as suggested, its own hospital fund it would be able to pay for its own patients as occasion arose. It would not be bound to support any particular hospital. Payment would be made, not only for the in-patients, but for such out-patients as there might be. If these hospitals are used, as it is suggested they should be, for various public services, school clinics, maternity and child welfare centres, and so on, they would derive from these a certain income.

Payment of the Medical Staff.

As to the payment of members of the medical staff, all insured persons and others for whose treatment they contract would be treated by them in hospital without any further fee. It must here be noted that there is a very real probability of the dependents of insured persons before long being granted medical and sickness benefit. For patients in the maternity ward, unless other arrangements are made, medical men, when called in by the midwife in charge, would receive the same fees as if the patients were in their own homes. For the patients of the public services the doctor would receive an agreed payment, but for all others they would make their own arrangements with each patient.

I am, Sir, yours faithfully,

Bradford-on-Avon, July 4th, 1919. CHAS. E. S. FLEMMING.

FEES FOR SERVICE ON PENSION BOARDS.

To the Editor of THE LANCET.

SIR,—At a general meeting of the medical practitioners in the Cheltenham area, held at the General Hospital yesterday evening, at which 27 were present, 11 of whom were demobilised doctors, the following resolution was passed *nem. con.*:—

That they were willing to act on the pension boards at a rate of either (1) one guinea per session dealing with not more than five cases per session; or (2) two guineas per session lasting two and a half hours.

It was further resolved that this resolution should be sent to THE LANCET.

I am, Sir, yours faithfully,

H. M. MEYRICK-JONES,
Honorary Secretary to the Committee of Medical Practitioners in the Cheltenham Area.

July 8th, 1919.

HUTCHINSON'S TEETH.

To the Editor of THE LANCET.

SIR,—A recent experience has suggested to the writer that in the course of time the characteristic notch described by the late Sir Jonathan Hutchinson in the upper central incisors may disappear. Some six years ago a girl was under my treatment for multiple ulcerative adenitis of the submaxillary region and neck. She had a somewhat depressed bridge to the nose, and upper incisors which showed a slightly curving notch in the cutting edge. A diagram was made of these teeth in the case-book and a note added that they were probably Hutchinson's teeth. A Wassermann test of the blood yielded a positive result and the case was regarded as possibly one of mixed syphilitic and

tubercular infection. The girl was treated with X rays, scraping of ulcerated glands, general tonics, and several intravenous injections of neosalvarsan. Later, a course of tuberculin emulsion was administered. Considerable improvement followed and the patient discontinued attendance.

The war intervened, but soon after the Armistice, on resuming hospital attendance, the patient presented herself with active recurrence of the adenitis. On inspection the upper incisors no longer showed any characteristic notches. Presumably the free edges of the teeth had been ground flat in the interval. Certainly no one now looking at them would suspect any present or former connexion with Hutchinson's teeth. I do not know if this possible source of fallacy has been noted elsewhere, but think it of sufficient interest to warrant a brief note.—I am, Sir, yours faithfully,

Harley-street, W., July 7th, 1919. DAVID WALSH, M.D.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If it has not been received a duplicate will be forwarded on request. We shall be grateful if the recipients will return the form by an early post.

We are, Sir, yours faithfully,

J. & A. CHURCHILL.

7, Great Marlborough-street, London, W. 1, July 7th, 1919.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of Fellows was held on July 3rd for the election of two Fellows to the Council, Sir George Makins, the President, being in the chair. Three vacancies should occur annually, and the term of office of Sir George Makins would have come to an end this year, but as he was President at the time of the election he became entitled to retain the position of member of the Council for another year. The result of the election was as follows:—

	Votes.	Plumpers.		Votes.	Plumpers.
Sir B. G. A. Moynihan	404	20	W. F. V. Bonney	130	15
C. S. Wallace	274	33	A. H. Tubby	114	7
F. J. Steward	168	51	J. F. Jennings	113	17

The President declared Sir Berkeley Moynihan to be re-elected and Mr. Wallace to be elected members of the Council. There were 667 postal votes, and 6 Fellows voted in person. Five voting papers were wasted, owing to Fellows voting for more than two candidates. Mr. H. J. Price and Mr. Willmott Evans acted as scrutineers.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Second Professional Examination in Anatomy and Physiology, held on June 26th, 27th, and 30th, and July 1st, for which 99 candidates presented themselves, 68 were approved and 31 were rejected. The following are the names and medical schools of the successful candidates:—

S. Ackroyd, Leeds Univ.; M. T. Ahmed, Guy's Hosp.; J. V. D. Allin and G. W. Ballance, Birmingham Univ.; V. H. Barker, London Hosp.; H. C. Blackmore, Univ. Coll.; Dora Mahalah Caiman, London Sch. of Med. for Women; N. L. Capener, St. Bart.'s Hosp.; Kathleen Frances Cawthorne, Univ. Coll.; S. B. Chambers, King's Coll.; Elizabeth Maud Chilson, London Sch. of Med. for Women; T. J. Clayton, King's Coll.; H. V. Croucher, Guy's Hosp.; W. Dabbs, Birmingham Univ.; Nancy Barbara Daniell, Univ. Coll.; Enid Marcella Dixon, London Sch. of Med. for Women; Alice Elizabeth Dove, Univ. Coll.; Beatrice Emily Ebden, King's Coll.; H. O. Eksteen, Cape Town Univ. and Guy's Hosp.; W. E. Farnham, Birmingham Univ.; W. C. Faull, St. Mary's Hosp.; Dora Janet Fox, London Hosp.; Lena Bella Gayer, London Sch. of Med. for Women; Nancy Kathleen Gibbs, Univ. Coll., Cardiff; Louisa Patricia Gordon, King's Coll.; F. Gulver, London Hosp.; A. W. Hall, Guy's Hosp.; B. J. Hallowes, St. Bart.'s Hosp.; E. Hardy, Guy's Hosp.; T. H. J. Hargreaves, King's Coll.; H. W. Harvey, Guy's Hosp.; Florence Reed Hodges, London Sch. of Med. for Women; R. J. Hodgkinson, Guy's Hosp.; G. H. Hogben, King's Coll.; J. Holroyd and D. Hoole, Manchester Univ.; W. D. Jenkins, Middlesex Hosp.; H. B. Jones, Guy's Hosp.; R. G. Karn, Univ. Coll.; B. L. Laver, Guy's Hosp.; Alfred Q. Logan, St. Thomas's Hosp.; O. E. J. McOustra, Univ. Coll.; Elizabeth Maitland-Jones, Univ. Coll., Cardiff; C. A. Marais, Guy's Hosp.; Kathleen Mary Matterson, King's Coll.; J. B. G. Muir, Middlesex Hosp.; R. E. Overton, Univ. Coll.; Hilda Winifred Page, London Sch. of Med. for Women; A. Pain, Middlesex Hosp.; R. E. Richards, Melbourne Univ. and King's Coll.; Hilda Marjorie Stebbing Russell, London Sch. of Med. for Women; Z. Salama, Cairo and Birmingham Univs.; E. T. Saravanamuttu, Madras Med. Coll.; L. Segal, Erlangen Univ.; C. M. Sh rt, Guy's Hosp.; H. L. Slaughter, St. Thomas's Hosp.; S. Somasundram, Ceylon Med. Coll. and Middlesex Hosp.; A. E. Strawbaun, Cape Town and Guy's Hosp.; B. H. Stribling, London Hosp.; H. A. Surial, Cairo and Birmingham Univs.; M. L. Sutcliffe, Univ. Coll.; R. O. Swaine, Middlesex Hosp.; M. Theiler, St. Thomas's Hosp.; Joyce Ellen Muriel White and Catherine Mabel Williams, London Sch. of Med. for Women; G. Wilson, King's Coll.; E. T. Wright, St. Mary's Hosp; and B. Zeitoun, King's Coll.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful in the subjects indicated:—

DOCTOR OF MEDICINE.

J. W. Bride, T. H. Oliver, and C. R. Sandiford.

FINAL M.B. AND CH.B. EXAMINATION.

Kathleen Doyle, Olive M. Gimson, Archibald Harris, J. G. Nolan (distinction in Surgery), Olga G. M. Payne, F. L. Pickett, Effie Ratner, A. E. H. Sadek, Annie G. Thompson, Marie Wardman, and Ruth A. Wilson (distinction in Medicine).

Medicine.—Elizabeth C. Davies and Doris M. R. Tompkin (distinction).

Obstetrics.—Doris M. R. Tompkin.

Forensic Medicine and Toxicology.—Samuel Adler, May Blakiston, Phyllis M. Congdon, J. W. Crawshaw (distinction), Kenneth Deakin, A. M. El Aguizy, F. R. Ferguson (distinction), Percival Fildes, Evelyn A. Garnett, E. M. Greaves, Joshua Harris, G. E. Hayward, Sylvia K. Hickson, J. B. Higgins, F. S. Horrocks, Irma M. C. Jehansart, F. C. Jones, Gertrude B. Leigh, H. A. Lomax, W. E. Mason (distinction), Doris B. Norman, Emily M. Peach, Harry Rosenthal, Annie Rothwell, Gerald Sheehan, Annie E. Somerford, G. L. Taylor, Henry Tomlinson, Mary I. Turner, F. A. Van Coller, Raymond Williamson, and J. B. Wright.

THIRD M.B. AND CH.B. EXAMINATION.

Pharmacology, Therapeutics, and Hygiene.—Simon Almond, G. V. Ashcroft, Nancy E. Bleakley, T. E. Coope, Muriel Coope, Eugenia R. A. Cooper, S. W. Drinkwater, Dorothy M. L. Dyson, Winifred M. Edgehill, T. N. Fisher, E. S. Frishman, Edward Gleaves, W. H. Gratrix, Albert Haworth, Ruth Hill, C. D. Hough, Marguerite F. Johnstone, Ernest Jones, J. I. Kelly, R. R. Lane, James Leather, G. H. Lees, W. L. Martland, Alexander Maude, Eva le Messurier, P. B. Mumford, Cecil Nelson, Terence O'Brien, L. S. Potter, W. E. Powell, Margaret Pownall, J. S. Robinson, F. H. Scotson, H. L. Sheehan, Margaret Single, J. W. Smith, Constance Snowdon, Harry Stafford, S. N. Taylor, Solomon Wand, Norah M. Walker, Sidney Waterworth, Robert Williamson, and J. R. Wright.

Hygiene.—E. S. van Aalten, Margaret McF. Corbold, and Caroline M. Edwardes-Evans.

SECOND M.B. AND CH.B. EXAMINATION.

Vincent Chadwick and N. S. Craig.

DIPLOMA IN DENTISTRY.

Third Examination.—Harold Walmsley.

Final Examination.—Teresa Candon, C. E. Cardwell, and R. L. Heelan.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the Convocation held on July 1st the following degrees were conferred:—

Doctor of Medicine (Essay).—Jessie Margaret Murray.

Doctor of Medicine for Practitioners of Fifteen Years' Standing.—Thomas Blanchard Sellors and Alfred Frank Tredgold (in absentia).

Master of Surgery.—William Robert Elstob Unthank.

Bachelor of Medicine and Bachelor of Surgery.—Dorothy Olga Sutherland Blair, Sujan Raj Chatterji, Ernest Dewar Charles, William Devereux Forrest, Alexander Thomas Harrison, James Richard Hughes, Leonard Wilfrid Hearn, Ram Mansoor, Hugh Ley Puxon Peregrine (in absentia), Thomas Norman Vickers Potts, William Reynolds (in absentia), Robert Sanderson, George Roebuck Woodhead, Harold Williamson, and Angus Hedley Whyte.

Bachelor of Surgery.—William Oxley Forster Sinclair.

Diploma in Public Health.—Edgar William Todd.

Licence in Dental Surgery.—Allan Maughan.

METROPOLITAN HOSPITAL SUNDAY FUND.—The following are among the amounts received at the Mansion House up to July 3rd, the total amount being then £45,000:—

The Right Hon. the Lady Strathcona and Mount Royal, £3000; St. Mark's, North Audley-street, £502; Messrs. Watts, Watts, and Co., Ltd., £315; Mr. John Latta, £262 10s.; Brompton Parish Church, £230; Brixton Independent Church, £206; Mr. Alexander Miller, £200; Lieutenant-Colonel More Bisbett, £200; St. Alphege, London Wall, with St. Mary, Aldermanbury, £166; St. George's, Hanover-square, £157; Wimbledon Churches, £154; Westminster Chapel, £141; All Saints, Ennismore-gardens, £116; Mr. A. R. Upjohn, K.C., £105; United National Collieries, Ltd., £105; British Oil and Cake Mills, Ltd., £105; Messrs. W. Gardiner and Co., Ltd., £105; Messrs. Moxey, Savon, and Co., and River Plate Coal Co., Ltd., £105; Messrs. Wilson, Sons, and Co., £105; St. Jude's, Mildmay Park, £105; Mr. J. Alec Roberts, £100; Messrs. Erlangers, £100; Mr. W. D. Graham-Menzies, £100; Brunswick Hall, Whitechapel, £100.

L.C.C. AMBULANCE SERVICE.—Reporting upon the Ambulance Service, the L.C.C. Establishment Committee mentions that it has considered, in conjunction with the Fire Brigade Committee, a letter from the British Medical Association (Metropolitan Branch) urging that, instead of appointing a principal administrative assistant as proposed, the Council should appoint an officer possessing medical qualifications. The two committees have jointly received a deputation from the Association, but after going carefully into the matter both committees are unanimously of opinion that the position should be purely administrative, and that a principal assistant should therefore be appointed. Any medical advice required can, of course, be given by the Council's medical officer of health.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The annual general meeting will be held at the West London Hospital on Friday, July 18th, at 5 P.M. A large attendance is desired, as the financial position of the society's journal will come up for discussion.

HOSPITAL SUNDAY FUND AT BRISTOL.—£4901 have been collected for the Hospital Sunday Fund at Bristol; it is hoped that £5000 will be eventually raised. This is a "record" sum and gratifying to Mr. J. H. Reed, the honorary secretary of the Fund, who is giving up the work in which he has taken a great interest for the past 21 years.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual general meeting of the London and Counties Medical Protection Society, Ltd., was held on July 2nd at the offices of the society, 32, Craven-street, Strand, W.C., Sir John Rose Bradford presiding. Major C. M. Fegen, treasurer of the society, in proposing the adoption of the annual report and balance sheet, said that the society was never in a better financial position, the reserve fund amounting to nearly £25,000. But he gave it as his opinion that the reserve should be £100,000. The report having been adopted, Sir J. Rose Bradford was unanimously re-elected president of the society.

ROYAL DEVON AND EXETER HOSPITAL.—In response to the appeal for £20,000 for the funds of this hospital over £10,000 have been already received.

HARROGATE MEDICAL SOCIETY.—A complimentary dinner was given at the Grand Hotel, Harrogate, on July 1st, by the members of the society who had stayed at home to those who had served in His Majesty's Forces. About 60 sat down, 30 of whom were guests. The chair was taken by Dr. John Gordon Black, and Dr. D'Oyly Grange proposed the health of the guests. Surgeon-Lieutenant O'Beirne Ryan responded on behalf of the Naval Medical Service, and Lieutenant-Colonel R. J. Morris, Major Ernest Solly, Major M. B. Ray, D.S.O., and Captain Shepherd Boyd for the R.A.M.C.

DEVON EDUCATION COMMITTEE AND MEDICAL CERTIFICATES.—At a recent meeting of the Devon Education Committee it was stated that a country medical practitioner considered he had a grievance, as a statement had been made by the attendance subcommittee that he had given medical certificates without cause, and he said that as long as that statement was on the committee's book he would not give a certificate. The school medical officer for the county, who had examined the children referred to in the certificate, said that he agreed with the medical man that they were unfit to attend school. It evidently appears as if the medical man had a grievance.

LONDON DERMATOLOGICAL SOCIETY.—The annual meeting of this society was held at St. John's Hospital on June 17th, Dr. A. T. Bremner, the President, being in the chair. After the presentation of the annual report and the balance sheet the following officers were elected for the year:—President: Dr. Morgan Dockrell. Honorary secretary: Dr. William Griffith. Honorary treasurer: Dr. W. Knowsley Sibley. A clinical meeting followed, after which Dr. Septimus Sunderland read a paper entitled "The Baths of Old London," the first part of which appears in this issue of THE LANCET.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—A meeting of the Court of Directors of this society was held on July 2nd, Sir Alfred Pearce Gould, the President, being in the chair. Twelve new members were elected, this being the largest number to be elected at any meeting since the centenary of the society in 1888. The death of an annuitant was announced who had come on the funds in 1890, her late husband having paid in subscriptions £38 17*s*; his widow and one child had received from the society the sum of £2900, the child being still in receipt of a grant of £50 per annum. It was pointed out that this case was a striking example of the benefits of joining, for relief is only granted to the widows and orphans of deceased members. The sum of £2036 5*s*. was voted for the payments of the half-yearly grants to the widows and orphans on the society's books—namely, 50 widows and 7 orphans. In addition, the sum of £285 was voted as a special Peace gift, each widow and orphan to receive £5. The invested capital of the society now stands at £140,000. This cannot by the bylaws be decreased, and only the income derived from it is used for the payment of grants and expenses. Membership is open to any medical practitioner who at the time of his election resides within a 20-mile radius of Charing Cross. The annual subscription varies with the age of the member at the time of his election, and starts at £2 2*s*.; there are special terms for life membership. Further particulars and application forms may be obtained from the secretary at the offices of the society, 11, Chandos-street, Cavendish-square, W.1.

The Services.

R.A.M.C. TEMPORARY OFFICERS.

As there appears to be some misunderstanding as to certain points in connexion with the terms of the recent offer[1] by the War Office of engagement in the Royal Army Medical Corps for service with the Army of Occupation, the Director-General, Army Medical Service, makes the following explanation.

(1) Officers who are at present serving in the Royal Army Medical Corps under contracts for 12 or 6 months or other definite stated periods will be required to complete these engagements, with the option of entering into the new contract on termination.

(2) Officers who are serving under contracts "until the termination of the present emergency" will be eligible for demobilisation on the statutory date for the end of the war which will be published, and the gratuities payable under such contracts will be issuable on that date.

(3) All officers who are at present serving may offer themselves for service with the Army of Occupation (such service to commence on the day following the completion of their present contracts) under the terms of the recent offer—namely, for a period of 12 months or until their services are no longer required, whichever may happen first, at a salary of £550 per annum plus rations or the allowance in lieu. The sum mentioned is inclusive of both bonus and gratuity, and no additional emoluments of any kind are issuable.

(4) Officers holding the acting rank of Lieutenant-Colonel or Major will be required to sign a contract embodying the above terms, but will draw the pay and allowances of their acting rank whilst holding it, the contract terms as to emoluments remaining in abeyance during that period; they will revert to contract rates on ceasing to hold the acting rank.

(5) Field officers of the Territorial Force and Special Reserve will receive the pay and allowances of their substantive field or acting rank.

(6) Officers will continue to draw children's allowance for the present.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Commdr. (acting Surg.-Capt.) P. W. Bassett-Smith specially promoted to the rank of Surgeon Captain in recognition of services rendered.

To be temporary Surgeon-Lieutenant: D. H. Cameron.

ARMY MEDICAL SERVICE.

Col. S. G. Allen retires on retired pay.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. S. H. Fairrie retires on retired pay.

Temp. Maj. (acting Lieut.-Col.) W. Robertson (Captain, R.A.M.C., T.F.) relinquishes his temporary commission on re-posting.

Captains to be acting Majors: K. P. Mackenzie, E. A. Strachan.

To be Captains: Capt. (acting Major) H. A. Sandiford, from T.F.; Temp. Capts. C. B. Hogg, E. E. Holden, W. Moodie, A. Mearns, F. H. Woods, F. A. L'Estrange.

Temp. Capt. R. S. Miller to be acting Major.

Lieutenants (temporary Captains) to be Captains: G. D. Gripper, G. T. Baker, H. C. Watson (acting Major) (and retains his acting rank), G. T. Gimlette.

Capt. N. V. Lothian to be acting Major whilst specially employed.

Capt. C. J. O'Reilly resigns his commission.

Capt. L. G. Bourdillon is seconded for service with the Egyptian Army.

To be seconded for service under the Civil Administration of Mesopotamia: Capts. and Bt. Majors A. G. J. MacIlwaine, L. Dunbar; Capts. T. J. Hallinan, P. A. Wilth, O. D. Jarvis.

Temp. Capt. H. F. Mullan relinquishes the acting rank of Major on re-posting.

Late Temp. Capts. to be Capts.: R. Marshall, H. W. M. Kendall, S. B. Faulkner.

To be Lieutenants and to be temporary Captains: Capts. G. H. Barry and T. Stanton, from Special Reserve; Temp. Capts. H. J. Davidson and T. H. Twigg.

Officers relinquishing their commissions: Temp. Lieut.-Col. J. C. Muir, and retains the rank of Captain; Major W. C. Devereux, and retains the rank of Major. Temp. Major R. H. Cooper granted the rank of Lieutenant-Colonel. Temporary Majors retaining rank of Major: J. R. Bibby, C. V. N. Lyne (Major, retired, Indian Army), W. McDougall, A. Drury. Temporary Hon. Majors retaining the honorary rank of Major: W. K. Carew, S. Bousfield. Temporary Captains: W. G. Cobb, B. Suggit. Temporary Captain granted the rank of Lieutenant-Colonel: G. D. Hindley. Temporary Captain and Brevet Major retaining the rank of Brevet Major: P. H. Bahr. Temporary Captains granted the rank of Major: A. V. Poyser, W. F. Law, M. A. Power, C. M. Kennedy, H. G. Joyce, A. J. Clayton, K. G. Fraser, J. W. Linnell, N. G. W. Davidson, W. C. Horton, E. T. Williams, R. W. Nairn, M. P. Paton, G. T. Foster Smith, G. H. Darlington, A. W. Rowe, G. C. Chubb, R. E. F. Pearse, H. F. Warwick, L. F. Hemmans, A. C. Sturrock, G. W. Riddell, P. R. Woodhouse, J. W. Applegate. Temporary Captains retaining the rank of Captain: A. H. Turner, J. W. A. Wilson, J. W. Tocher, F. J. Cutler, L. C. Dillon-Kelly, W. J. D.

[1] THE LANCET, June 28th, p. 1137.

Bromley, J. Love, P. W. Moore, T. J. Lloyd, B. T. Lang, H. Bardsley, W. Browne, W. H. Parkinson, C. W. Forsyth, L. N. Lee, R. Parry, J. Brown, V. G. Maitland, J. Graham, F. Jubb, C. G. Lamble, J. D. Oliver, E. J. Clark, E. C. Malden, J. M. Hall, H. C. Quirke, C. D. Holdsworth, D. M. Baillie, L. D. Saunders, G. S. Brown, E. P. Scott, E. H. Udall, E. W. Smerdon, A. J. Beadel, A. N. Hodges, W. J. Henry, G. H. Steven, R. R. Armstrong, H. Farncombe, S. McMurray, F. H. Pickin, R. Nunn, K. D. Melville, J. R. Prytherch, H. F. Blood, J. C. McMillan, R. H. Calvert, E. A. Morgan, J. R. Cameron, J. Paton, A. Feiling, W. A. Reynolds, A. N. Hooper, A. Rutherford, R. Duncan, T. C. Hynd, T. C. Innes, W. A. Easton, W. B. Gordon, C. E. Harrison, J. W. Fox, J. E. Finlay, D. J. Evans, S. G. Graham, J. B. Ball, W. L. Webb, M. L. Farmer, R. Cope, G. Davidson, J. G. Garson, W. R. G. Hamilton, F. W. Milne, M. J. Fraser, M. D. Mackenzie, G. E. Lloyd, R. E. Moyes, J. F. Jennings, C. G. Mackay, A. F. Morcom, A. V. McMaster, A. E. Staffurth, W. J. Woodman, W. Duguid, S. C. Pritchard, W. S. Sheppard, A. H. Aldridge, J. S. Dunn, G. R. C. Wilson, T. B. Welch, S. G. Kean, F. J. Dunne, J. Watson, H. Stokes, H. W. Smith, R. M. Wishart, H. E. S. Stiven, A. R. Moore, R. Denman, C. C. Morrell, W. R. Wiseman, R. G. Abrahams, D. A. Hutcheson, W. Reid, W. O. Roberts, G. E. Stephenson, N. M. Cummins, J. C. Lorraine, H. F. Mullan, A. St. Johnston, W. K. Calwell, J. W. McLeod, C. Cameron, W. P. Morgan, L. B. Williams, D. S. Pracy, J. Wyper, O. L. V. de Wesselow, W. H. Thresher, D. Meek, F. H. Moran, C. T. W. Hirsch, J. B. Wall, W. D. Kirkwood, A. G. East, T. Winning, D. Wainwright, J. H. Johnston, J. Williamson, G. B. Richardson, J. M. Taylor, W. N. Montgomery, P. Cheal, L. Wayne-Morgan, G. Whittington, W. G. Silvester, F. H. Alexander, J. E. R. Orchard, D. P. Smith, W. E. Bullock, C. W. Somerville, A. K. S. Wyborn, A. M. Clark, S. Churchill, M. S. Baines, F. D. Cairns, M. J. Ahern, J. W. Cowie, W. V. Coffyn. Temporary Lieutenants retaining the rank of Lieutenant: A. D. Pringle, J. C. Bell, C. H. C. Casen.

Canadian Army Medical Corps.

Temporary Lieutenant-Colonels (acting Colonels) to be temporary Colonels: W. T. M. MacKinnon, F. Guest.

Temporary Majors (acting Lieutenant-Colonels) relinquishing the acting rank of Lieutenant-Colonel: J. L. Cock, G. W. Treleaven, A. H. Taylor.

Temporary Captains (acting Majors) relinquishing the acting rank of Major: C. K. Dowson, R. B. Mitchell.

Temporary Captains (acting Majors) to be temporary Majors: A. W. Bagnall, H. C. Mersereau, J. Seager, H. K. Bates, H. H. Argue, L. A. Richmond, J. McCulloch, F. T. Campbell, H. M. Barrett, F. H. Pratten, F. W. Lees, E. Douglas, L. C. Palmer, A. P. Chown, F. J. Tees, W. V. Lamb, D. P. Hanington, R. N. W. Shillington, W. J. MacKenzie, J. H. Moore, W. A. Wilson, S. R. Johnston, T. M. Creighton, F. F. Dunham, A. G. MacLeod, D. A. Clark, C. B. Preston, F. W. Blakeman, V. N. MacKay, J. A. Murray, F. B. Bowman, A. B. Schinbein, M. H. Allen, W. Ross, W. G. Cosbie, C. E. Anderson, C. W. Waldron, F. V. Woodbury, H. W. Wadge, T. R. Little, E. L. Pope, R. R. Barker, H. G. Wood, J. J. Thomson, H. O. Boyd, A. Blais.

Honorary Captains (acting Honorary Majors) to be Honorary Majors: A. E. Clifton, H. J. Testar, J. W. White.

Honorary Lieutenants (acting Honorary Captains) to be Honorary Captains: J. F. Christie, H. T. Cameron, A. P. Ross, W. R. Duff, H. G. Iliffe, F. White.

GENERAL RESERVE OF OFFICERS.

Major J. W. Jennings to be Lieutenant-Colonel.

SPECIAL RESERVE OF OFFICERS.

Capt. (acting Major) W. McN. Walker relinquishes the pay and allowances of his acting rank.

TERRITORIAL FORCE.

Majors (acting Lieutenant-Colonels) relinquishing their acting rank on ceasing to be specially employed: J. W. Bird, D. H. Weir, W. A. Thompson, H. T. Samuel, R. T. Turner.

Capt. (acting Lieut.-Col.) E. Knight relinquishes his acting rank on ceasing to be specially employed.

Major (acting Col.) H. Richardson relinquishes his acting rank on vacating the appointment of Assistant Director of Medical Services.

Capts. (acting Majors) relinquishing their rank on ceasing to be specially employed: T. B. Layton, R. Phillips, W. F. B. Benstead-Smith, J. H. Jordan, P. S. Martin, F. H. Robbins, W. T. Gardiner, A. W. Hayward, H. B. Cunningham, J. C. S. Dunn.

Capt. (acting Major) L. P. Harris relinquishes his acting rank on vacating the appointment of Deputy Assistant Director of Medical Services, and is restored to the establishment.

Capt. (acting Major) S. F. St. J. Steadman relinquishes his acting rank on vacating the appointment of Deputy Assistant Director of Medical Services.

Capt. (acting Major) P. C. P. Ingram relinquishes his commission and is granted the rank of Major.

1st Eastern General Hospital: Capt. C. H. Budd is restored to the establishment.

Sanitary Service: Capt. W. Robertson is restored to the establishment on ceasing to hold a temporary commission in the R.A.M.C.

2nd London Sanitary Company: Lieut. C. J. Regan to be Captain.

TERRITORIAL FORCE RESERVE.

Capt. E. S. Taylor, from 2nd London Casualty Clearing Station to be Captain.

ROYAL AIR FORCE.

Medical Branch.—Capts. H. T. H. Butt, W. F. Walker, R. H. Dixon, and Lieut. G. M. Mellor are transferred to unemployed list.

Dental Branch.—Lieut. H. Wardill is transferred to unemployed list.

INDIAN MEDICAL SERVICE.

Majors to be Lieutenant-Colonels: G. P. T. Grouhe, E. D. W. Greig, W. E. McKechnie, W. F. Harvey, W. C. H. Forster, J. J. Urwin, D. McCay, A. B. Fry, E. C. G. Maddock, W. H. Dickinson, A. W. Tuke, G. H. Stewart.

AT the last meeting of the Launceston (Cornwall) board of guardians Dr. W. F. Thompson resigned the post of medical officer for the No. 3 district after 35 years' service.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 2ND.

Treatment of Tuberculous Pensioners.

Sir J. D. REES asked the Pensions Minister what steps he proposed to take to provide for concurrent treatment and training on the colony system of pensioners suffering from tuberculosis; and whether he had under consideration the proposals on this behalf of the East Midlands Joint (Disablement) Committee.—Major ASTOR (Parliamentary Secretary to the Ministry of Health) replied: The Inter-Departmental Committee on Tuberculosis have under consideration the question of the provision of colonies for the concurrent treatment and training of discharged men suffering from tuberculosis, and I understand that the report of the Committee is expected very shortly. My right honourable friend has been informed of the proposals for the acquisition of an estate in Derbyshire for the concurrent treatment and training of discharged men suffering from tuberculosis, and I will instruct one of the medical inspectors to visit the estate and report upon the scheme.

THURSDAY, JULY 3RD.

Welsh Board of Health.

Brigadier-General Sir OWEN THOMAS asked the Minister of Health whether it was proposed to give representation on the Welsh Board of Health to the executive committee of the Welsh National Memorial Association, to the North and South Wales nursing associations, and to the executives of North and South Wales soldiers' and sailors' disablement committees.—Major ASTOR replied: As I stated in reply to a question by the honourable and gallant Member on June 30th, the Board is not yet complete; but I may point out that Section 5 of the Ministry of Health Act requires the persons constituting the Boards to be officers of the Ministry, and that this requirement excludes the possibility of adopting the principles suggested in the question as determining the nature of future appointments to the Board. The important bodies referred to in the question will probably be asked to suggest suitable names of persons for membership of the Consultative Council of the Ministry of Health in Wales.

Brigadier-General Sir OWEN THOMAS asked the Minister of Health if he would state what was the amount of the total remuneration paid to those Commissioners of the Welsh Insurance Commission, now transferred to the Welsh Board of Health, during the period of war; what time was devoted by them to the specific duties of the Commission during that period; what was the salary to be paid to the chairman, members, and officers of the Welsh Board of Health already constituted; and what further salaries, if any, were to be paid to the members of the Board yet to be appointed.—Major ASTOR replied: The remuneration of the three members of the Welsh Insurance Commission who have now been appointed members of the Welsh Board of Health was at the rate of £1000, £1200, and £1000 per annum respectively, and no change has been made in these rates on their transference. The whole time of the Commissioners was very fully occupied with Health Insurance work, except in so far as they undertook various forms of temporary war work from time to time. The point in the last paragraph of the question has not yet come up for decision and no decision has been taken on it.

National Health Insurance Bill.

Major ASTOR (Parliamentary Secretary to the Ministry of Health) moved the second reading of the National Health Insurance Bill. He said it was not in any way an attempt to amend the Insurance Act, 1911. The whole object of the Bill was to maintain as far as possible the status quo. Because of the change in money values a large number of people who in 1911 were earning round about £160 were now earning something like £250. The original Act, which made insurance compulsory for non-manual workers with a low income, would, unless this amendment were made, drive out of insurance nearly 1,000,000 insured persons. In selecting the figure of £250 instead of £160 they had been guided by the award of the Conciliation and Arbitration Board for Government employees. It would be a real hardship if, having contributed over a considerable period towards insurance, anything up to a million persons were to lose the benefit of their contributions, and that would happen as from June 30th last unless this small Bill were passed. If this Bill were not passed a large number of medical men who dealt with insured persons would lose their patients. He had received deputations from medical men. There was one point which was raised, and that was the bringing into insurance of that very limited class—some 20,000 or 30,000 people so far as

they were able to estimate—who would for the first time be brought into insurance. He told the deputation that they did not want to bring these people into insurance, but that they found it administratively impossible to exclude them. They tried to frame a clause which would exempt them, but were unable to do so. He asked his honourable friends to do the same, and if in Committee they were able to put down an amendment which carried out their intention, and what the Government would like to include in the Bill, they would be pleased to accept it.

Criticism of the Bill.

Major FARQUHARSON said that he quite agreed that there existed a necessity for some such Bill, and he was quite sure that the whole community, with the medical profession as well, would agree that people who were now insured persons, and had been for some time insured persons, should not lapse their insurance benefits because of the altered values of money. But he had to find fault with the text, and with the effect of the Bill. The text was so framed that the annual income was taken as a basis for determining that certain people should now be in insurance who had not been in insurance before. The new limit of £250 meant that a large number of entrants into insurance benefits were legalised by statute. He had not the slightest objection to everybody and anybody obtaining insurance benefits, but let them remember that the position they were now in was standardised and fixed by statute. The medical men made certain definite binding contracts that they would attend people whose incomes did not exceed £160. Those contracts were now in existence and were passed in review at the end of each year. The medical profession had a right to stand upon the sanctity of a contract, and to demand that they should not be penalised for the benefit of any section of the community. He would take this question from the point of view of the panel practitioner. The Government had contracted with him at the present time to do certain definite things under certain definite rules. This had been departed from. Take the case of the non-panel practitioner—the middle-class non-panel practitioner attending people for small fees. By this Bill all these non-manual workers, such as clerks, would be compelled to be insured. Major Astor's estimate was the merest conjecture. The number might be very large or very small, but on the one hand the Government was destroying a contract of service with the panel practitioners, and on the other destroying a great many practices of men working hard for a livelihood. At this time, when great schemes of medical service were coming before the country, he thought this was a most inopportune moment to tamper with a contract of service. He appealed to the Government to accept some modification of the Bill which would enable at least a postponement of new entrants into insurance and for the whole scheme of medical insurance to be considered.

An Amendment.

Captain ORMSBY-GORE moved:—

"That this House declines to proceed with a measure which increases the number of persons compelled to make contributions towards the funds administered by the National Health Insurance Commissioners without guaranteeing acceptable medical service to all insured persons and without establishing the principle of free choice both by patient and medical practitioner."

He said that he did think that it was fair to say that sufficient attention had not been paid to the point of view of panel doctors and also non-panel doctors. The intention of Parliament in the original Act, Clause 15, Subsection (3), had not been carried out. The National Health Insurance Commissioners and the Committees set up under that Act had not provided acceptable medical service to insured persons where those insured persons were either unwilling or unable to make use of the services of the panel doctors. The result was that in the town of Stafford a few panel doctors had far more patients than they could pay attention to, and the remainder of the doctors got nothing from the Insurance Committee or the Insurance Fund. Still, they were dealing with over 700 insured persons, and these had to pay twice over. That was a grievance which had to be redressed. If the insured persons were to be considered with respect to wages, the doctors ought to be considered too.

Captain ELLIOT seconded the amendment. The main point he wished to make was that the Insurance services just now from a medical point of view were not satisfactory. Great services under the Insurance Act were still being given for charity as they were before. The services of consultants, surgeons, and so on were being given just the same as before. He did not think that was a fitting way for service to the sick of this country to be rendered.

Lieutenant-Commander KENWORTHY hoped that the amendment would not be pressed. In most parts of the country, though possibly not in Stafford, the Insurance Act was giving satisfaction to the insured. He was interested in the indignation of Major Farquharson when he told the Government of the hardships of the medical practitioner at the present time and threatened that the doctors would form a trade-union. They were in a trade-union.

Honourable Members: No!

Commander KENWORTHY: Yes, they are in the most exclusive union in the country.

Honourable Members: No! No!

Captain ELLIOT: But they do not strike.

Commander KENWORTHY: They have threatened to strike in the past. Continuing, the honourable Member said he was sure that Members on that side of the House would be only too glad to support any motion made by the Minister of Health to increase the fees chargeable by panel doctors, for he thought it was recognised that they had a hard case and that it should be done. But let them get this Bill through first.

Sir P. MAGNUS said that while he was prepared to support the second reading of the Bill he thought that very important and drastic changes should be made in it.

After further discussion, Major ASTOR appealed to the mover of the amendment not to press it. The point he made he thought was already met, as the persons brought in would have the right of claiming a certificate of exemption. As regarded what Captain Ormsby-Gore had said about the insured persons in his constituency, that was not a matter of legislation but of administration. He could assure him that the Minister of Health and himself would go into the matter and see if anything could be done. He welcomed this opportunity of paying a tribute to the splendid services which the medical profession had rendered to the wounded in France and England during the war. They all realised that, and also the extent to which they could count upon the profession in the future in the administration of the Ministry of Health.

Captain ORMSBY-GORE withdrew his amendment and the Bill was read a second time and referred to a Standing Committee.

FRIDAY, JULY 4TH.

Nurses' Registration Bill.

The adjourned debate on the Report Stage of the Nurses' Registration Bill was resumed.

Major NALL said that he had received a letter from the College of Nurses intimating that on the Government undertaking to introduce a registration Bill for nurses they were ready to withdraw their Bill in the House of Lords. The promoters of the Bill now before the House had refused a week ago to withdraw it, and as there was now very little time to consider the amendments on the paper he moved that the further consideration of the Bill should be adjourned in order that it might be allowed to lapse.

Captain BARNETT protested against the organised opposition to this Bill, and said that but for this there would have been ample time to get it through its various stages and send it up to the House of Lords, where some agreement might be arrived at. He hoped the Ministry of Health would nevertheless have the courage to bring forward a measure on behalf of the Government.

Major ASTOR nodded assent.

The motion to adjourn the further consideration of the Bill was agreed to.

Syphilis Treatment.

Mr. WATERSON asked the Minister of Health whether his Department was taking any action in regard to the recent death of a girl in St. George's Hospital while undergoing treatment for congenital syphilis; what drug was used in this case, and whether it had received the approval of his Department; whether he proposed to continue to approve of the use of such drugs; whether it was a fact, as stated by a medical witness at the inquest, that there had been a crop of such cases at Cambridge and Dublin during the war; how many deaths of this description had occurred in England and Wales since the beginning of the war; and whether he would make arrangements for the immediate report to his Department of all such deaths, both among soldiers and ex-soldiers and in the general population, in order that careful records might be available for reference?—Major ASTOR (Parliamentary Secretary to the Ministry of Health) replied: The answer to the first part of the question is in the affirmative. The case referred to is under inquiry by the Special Committee appointed by the Medical Research Committee to investigate the results of the treatment of syphilis by salvarsan and its substitutes. I understand that the drug used in this case was novarsenobillon, which is one of the drugs approved by my Department for the treatment of syphilis and tested under arrangements made by the Medical Research Committee. I am not aware of any sufficient reason for discontinuing the approval of the use of this and similar drugs. In this connexion I may add that I understand the coroner's finding at the inquest on this case was that this drug was properly administered and in proper amount. I understand that there have been several fatal cases following, though not necessarily caused by, the adminis-

tration of these drugs in military hospitals at Cambridge and Dublin during the war, and these cases also are under investigation by the Special Committee. No precise information is at present available as to the number of deaths of this description which have occurred in England and Wales since the beginning of the war, but the total number is, of course, very small, especially in proportion to the very large number of injections of such drugs taking place daily. The suggestion in the last part of the question will be considered with the report of the Special Committee when it is received. Already my Department have been considering the desirability of requiring special reports direct to the Ministry of all exceptional results following the administration of these drugs.

TUESDAY, JULY 8TH.

Medical Demobilisation.

Mr. MACQUISTEN asked the Secretary for War if he would state what was the general policy of medical demobilisation; why the promise given by the Ministry of National Service in November, 1918, that the demobilisation of medical men with long service or with practices to return to would be effected rapidly by replacing them with newly qualified graduates had not been given effect to; and how many, if any, temporary commissions in the Royal Army Medical Corps had been granted since the Armistice.—Mr. CHURCHILL replied: The demobilisation of an individual medical officer is left in the hands of the General Officer Commanding-in-Charge concerned, and the policy is to release first those who, on account of age, length of service, personal hardship, public expediency, &c., are considered most deserving of consideration. It will readily be understood that even then it is impossible to meet every claim, as it is still found necessary to retain certain officers possessed of special qualifications and for whom it is found impossible to find substitutes. Any applications received by the War Office are given every consideration, and when the claims of either an individual medical officer or the application of any public body for the services of a particular officer come under any of the above categories every effort is made to obtain his release, but his claim has to be considered in conjunction with the claims of other officers serving in the same Command at home or Expeditionary Force overseas. No temporary commissions have been granted in the Royal Army Medical Corps since the Armistice, but a new contract has now been approved whereby it is hoped that a large number of recently qualified medical men will volunteer for service overseas, and thus enable those who have served longest to be released.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, London.
Care of the Nose and Throat. By W. Stuart-Low, F.R.C.S. Eng. Pp. 63. 3s. 6d.

CASSELL AND CO., LTD., London.
Food and Public Health. By W. G. Savage, M.D. Pp. 156. 5s.
Infant and Child Welfare. By H. Scurfield. Pp. 166. 5s.
The Story of English Public Health. By Sir Malcolm Morris, K.C.V.O. Pp. 166. 5s.

CHURCHILL, J. AND A., London.
Vicious Circles in Disease. By J. B. Hurry, M.D. 3rd ed. Pp. 377. 15s.
A Short Practice of Medicine. By Robert A. Fleming, M.D. 3rd ed. Pp. 676. 21s.
The Ophthalmoscope. By G. Hartridge, F.R.C.S. 6th ed. Pp. 152. 6s. 6d.

FROWDE, H., AND HODDER & STOUGHTON, London.
The Nervous Heart. By R. M. Wilson, Captain, R.A.M.C., and J. H. Carroll, Major, M.C., U.S.A. Pp. 136. 6s.
Constipation and Allied Intestinal Disorders. By A. F. Hurst, M.D. 2nd ed. Pp. 440. 16s.
Psychoses of the War. By H. C. Marr, Lieutenant Colonel, R.A.M.C. (Temp.). 16s.
Trench Fever, a Louse-borne Disease. By Major W. Byam, R.A.M.C., and others. With Introduction by Lieutenant-General Sir T. H. Goodwin, a Foreword by Major-General Sir David Bruce, and a Summary of the report of the American Trench Fever Commission by Lieutenant R. H. Vercoe, R.A.M.C. Pp. 196. 10s. 6d.

GRIFFIN, CHARLES, AND CO., London.
Handbook of Medical Jurisprudence and Toxicology. By W. A. Brend, M.D. 3rd ed. Pp. 317. 10s. 6d.
Medical and Surgical Help for Shipmasters and Officers in the Merchant Navy. By W. J. Smith, F.R.C.S. Revised by A. Chaplin, M.D. 5th ed. Pp. 355. 6s.
Surgical Handbook. By F. M. Caird, M.B., and C. W. Cathcart, M.B. 18th ed. Pp. 364. 8s. 6d.

LEWIS, H. K., AND CO., LTD., London.
The Diagnosis and Treatment of Heart Disease. By E. M. Brockbank, M.D. 4th ed. Pp. 158. 5s.
Practical Vaccine Treatment for the General Practitioner. By R. W. Allen, M.D., late Captain, N.Z.M.C. Pp. 308. 7s. 6d.
Massage and the Swedish Movements. By Kurre W. Ostrom (Upsala). 8th ed. Pp. 196. 5s.

WRIGHT, JOHN, AND SONS, LTD., Bristol.
On Gunshot Injuries to the Blood-Vessels. By G. H. Makins, G.C.M.G., C.B. Pp. 252. 21s.

YEAR BOOK PUBLISHERS, Chicago.
Practical Medicine Series. 1919. Vol. I. Edited by F. Billings, M.D. Pp. 622. $2.50.

Appointments.

GAMGEE, LEONARD P., F.R.C.S., has been appointed Professor of Surgery in the University of Birmingham.

GOODBODY, F. W., M.D. Dub., M.R.C.P. Lond., Lecturer in Medical Chemistry in University College, London.

GRAY, H. T., F.R.C.S. Eng., Honorary Surgeon to the Infants Hospital, Vincent-square, Westminster.

JUPP, EDGAR NORMAN, M.D. Brux., L.R.C.P., M.R.C.S., Medical Officer and Public Vaccinator for the North Chardstock District of the Axminster (Devon) Union.

LISTER, A. E. J., Major, I.M.S., M.B., B.S. Lond., F.R.C.S. Eng., an Honorary Surgeon to H.E. the Viceroy and Governor General of India.

LUMSDEN, THOMAS, Medical Referee to the Ministry of Pensions for Westminster.

SANDILAND, E. L., M.B., B.S. Lond., D.P.H., Resident Medical Officer to the Croydon Borough Sanatorium.

SHATTOCK, CLEMENT E., M.D., M.S., F.R.C.S., Surgeon to Out-patients, Paddington Green Children's Hospital.

WALKER, C. D., M.B., Ch.B. Edin., one of the Medical Referees under the Workmen's Compensation Act, 1906, for the County Court Circuits Nos. 13 and 18.

WOODRUFF, D., Medical Officer and Public Vaccinator for the No. 9 District of the Bodmin (Cornwall) Union.

University of St Andrews.—PRICE, L. T., M.B. Ch.B. Edin., Professor of Surgery; CHARTERIS, F. J., M.B., Ch.B. Glasg., Professor of Materia Medica.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—Two S.'s.
Birmingham General Hospital.—Res. M.O. £155. Hon. S. Hon. Aural S. and Laryngologist. Asst. P. £50. Surgical Registrar. £200.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £150.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £200.
Bury County Borough.—Asst. M.O.H., Asst. Sch. M.O., and Asst. Tuberc. O. £550.
Bury, St. Edmund's, West Suffolk General Hospital.—Res. H.S. £175.
Canterbury, Kent and Canterbury Hospital.—Jun. Res. M.O. £150.
Cheam, Surrey, St. Anthony's Hospital.—Res. M.O.
Chelmsford Borough.—M.O.H. and Sch. M.O. £600.
Chelsea Hospital for Women, Arthur-street, S.W.—H.S. £120. Also Registrar. £50.
Chorley Borough Education Committee.—Asst. Sch. M.O. £400.
Darlington General Hospital.—H.S. £225.
Devonport, Royal Albert Hospital.—Res. H.S. £200.
Didworthy, Devon and Cornwall Sanatorium.—Locum Tenens. 6 gs. a week.
Edinburgh City.—Clin. M.O. under Venereal Diseases Scheme. £750.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250.
Gravesend Hospital.—H.S. £200.
Great Northern Central Hospital, Holloway, London.—Oph. S.
Grosvenor Hospital for Women, Vincent-square, Westminster.—Surgical Registrar.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.
Hospital for Sick Children, Great Ormond-street, London, W.C.—P. and S. Also Surgical Registrar. £200. Also H.S. £50.
Isleworth Infirmary.—Sec. Asst. to Med. Supt. £300.
Khartoum, Wellcome Tropical Research Laboratories.—Assistant Bacteriologist. £E.600.
Leeds Education Committee.—School M.O.'s. £400.
Leeds University.—Lect. in Experl. Phys. £500. Demonstr. in Phys. £250. Demonstr. in Hist. £250.
Lewisham Union, Forest Hill District.—M.O. £185.
Liverpool, Fazakerley Sanatorium for Tuberculosis.—Asst. Res. M.O. £250.
Liverpool School of Tropical Medicine.—Asst. Lect. in Parasitology. £250.
L.C.C. Hackney Institute, Dalston-lane.—Lecturer of Sanitary Science. 30s. an attendance.
London Hospital, E.—Surgical Registrar. Also First Asst.
London Lock Hospital, 283, Harrow-road, W.; 91, Dean-street, Soho, W.—Registrar.
London (Royal Free Hospital) School of Medicine for Women.—Two Demstrs. of Anat. £250. Also Female Pharm. £250.
London Temperance Hospital, Hampstead-road, N.W.—Asst. Res. M.O. £120. Also Casualty Officer. £120.
Maidstone, West Kent General Hospital.—H.S. and Asst. H.S. £250 and £125.
Manchester, Crossley Sanatorium.—Asst. M.O. £100.
Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Hon. Asst. P.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester, St. Mary's Hospitals for Women and Children.—Three H.S.'s £100.
Merthyr Tydfil County Borough.—Female M.O. for Maternity and Infant Welfare Work. £500.
Metropolitan Borough of Deptford.—Asst. M.O.H. £400.
Otago University, New Zealand.—Prof. of Syst. Med., Prof. of Clin. Med. and Therap., and Lect. on Clin. Med. £600, £500, and £400 respectively.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P., Hon. Med. Regist., and Hon. Anæsth. Also Clin. Assts.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Phys. to Out-patients.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Ophth. S.'s. Also H.S.
Rossall School, Fleetwood.—Res. M.O. £250.
St. Helens County Borough.—Asst. M.O.H. £500.
St. John's Hospital for Diseases of the Skin, 49, Leicester-square.—Electro-Therapeutist. £100.

St. Marylebone General Dispensary, 77, Welbeck-street, Cavendish-square, W.—Res. M.O. £150.
St. Peter's Hospital, Henrietta-street, Covent Garden, W.C.—Anæsth. £25.
Sheffield Royal Infirmary.—Asst. H.P. £150. Oph. H.S. £150.
Southampton County Borough Isolation Hospital.—Res. M.O. £400.
Stockport County Borough Education Committee.—Sch. Doctor. £400.
Tingwall, Whiteness, and Weisdale Parish.—M.O. and Pub. Vac. £45
Tottenham Maternity and Child Welfare Committee, Antenatal Clinic.—Female M.O. £1 11s. 6d. per session.
University College Hospital, Gower-street, W.C.—Res. M.O. £150.
Victoria Hospital, Tite-street, Chelsea, S.W.—H.P. and H.S. £100.
Wolverhampton and Staffordshire General Hospital.—Path. & Bac. £350 Also Res. M.O. £200.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Basingstoke (Hants) and Newport (Pembroke).

Births, Marriages, and Deaths.

BIRTHS.

DICK.—On July 3rd, at Walton Lodge, Walton-on-the-Hill, the wife of F. A. Dick, M.B., of a daughter.
SELLS.—On July 2nd, at Westcliff-on-Sea, the wife of Roland Sells, M.R.C.S., L.R.C.P., of a son.
STOWELL.—On July 6th, at "Fir Grove," Northwich, Cheshire, the wife of Thomas B. A. Stowell, F.R.C.S. Eng., of a son.

MARRIAGES.

JONES—DUGDALE.—On July 1st, at S. Philip's Church, Blackburn, William Edmund Jones, M.R.C.S., L.R.C.P., of Blackburn, to Edith Muriel, youngest daughter of the late Adam Dugdale and of Mrs. Dugdale, of Griffin Lodge, Blackburn.
LYNCH—DOUGHTY.—On July 1st, at St. Peter-upon-Cornhill, E.C., Arthur Louis Lynch, M.D., C.M., F.R.C.S., Capt. R.A.M.C., to Janet Hunter Elizabath (Jean) Doughty, daughter of the Rev. George Bell Doughty and Mrs. Janet Hunter Doughty, Westbourne-gardens, W.
MCMASTER—STEWART.—On July 2nd, at All Saints, Kenley, Surrey, Archibald Cotterill McMaster, M.B., F.R.C.S.E., to Netta, daughter of the late James Henry Fowler Stewart, Ardross, Ross-shire.

DEATHS.

COLLINS.—On July 9th, at Sproxton, New Wanstead, Frank Collins, M.R.C.S., L.R.C.P., suddenly, after many months of ill-health.
DODD.—On July 3rd, at Drummond-road, Bournemouth, Henry Allnutt Dodd, M.R.C.S., L.S.A., aged 90.
SELLS.—On July 4th, at the R.A.F. Hospital, Swanage, Captain Clement Perronet Sells, M.C., R.A.M.C. (T.), aged 23.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Communications, Letters, &c., to the Editor have been received from—

B.—Dr. I. Bram, Philadelphia; British Temperance League, Lond., Sec. of; Mrs. E. J. Brice, Taunton; Board of Agriculture and Fisheries, Lond.; Dr. J. Brown, Blackpool; Messrs. Burroughs Wellcome and Co., Lond.; Mr. J. B. B. Burke, Lond.
C.—Mr. J. Cabburn, Lond.; Crystal Press, Ltd., Lond., Sec. of; Dr. T. F. Cotton, Lond.; Dr. H. P. Cholmeley, Forest Row; Dr. A. G. Clark, Bedford; Dr. J. P. Cammidge, Lond.; Canadian Medical Directory, Montreal.
D.—Dr. J. A. Delmege, Lond.; Surg.-Lieut.-Comm. S. F. Dudley, R.N.; Mr. L. I. Dublin, New York.
F.—Dr. C. E. S. Flemming, Bradford-on-Avon; Mr. H. Frankling, Harrogate.
G.—Mr. S. G. Gould, Lond.; Great Northern Central Hospital, Sec. of; Dr. A. K. Gordon, Lond.; Major W. E. Gallie, C.A.M.C.; Dr. A. G. Gibson, Oxford; Mr. G. E. Gask, Lond.; Dr. R. G. Gordon, Bath.
H.—Dr. E. Holland, Lond.; Dr. J. E. Hett, Kitchener; Prof. A. Hopewell-Smith, Philadelphia; Fleet-Surg. W. E. Home, R.N.; Dr. H. Head, Lond.; Dr. E. C. Hort, Lond.
I.—Ilford, Medical Officer of Health of; Imperial Travel Bureau, Lond.
K.—Mr. U. S. Kowshik, Bombay.
L.—London County Council, Medical Officer of; Lebanon Hospital for Mental Diseases, Lond., Gen. Sec. of; London and Counties Medical Protection Society, Gen. Sec. of; London Dermatological Society, Hon. Sec. of; Mr. S. S. Lindsay, Lond.; Major J. H. Lloyd, R.A.M.C.
M.—Dr. C. A. Mercier, Bournemouth; Mr. T. Macquaker, Lond.; Medico-Psychological Association of Great Britain and Ireland; Ministry of Health, Lond.; Dr. A. S. MacNalty, Lond.; Dr. H. M. Meyrick-Jones, Cheltenham.
N.—National Dental Association, Lond., Gen. Sec. of.
O.—Dr. C. M. O'Brien, Dublin.
P.—Dr. S. V. Pearson, Mundesley; Panel Committee for the County of London; Dr. H. R. Prentice, Lond.
R.—Royal Institute of Public Health, Acting Sec. of; Dr. J. D. Rolleston, Lond.; Dr. J. N. Robins, St. Peter's-in-Thanet; Royal Society of Medicine, Lond., Sec. of; Mr. W. H. C. Romanis, Lond.
S.—Dr. A. G. Shera, Eastbourne; Society for Relief of Widows and Orphans of Medical Men, Lond., Sec. of; Mr. S. L. Sharma, Meerut; Dr. S. V. Sunderland, Lond; South London Hospital for Women, Sec. of; Standard Motor Co., Lond.; Prof. W. Stirling, Manchester; Mr. R. E. Smith, Barry.
T.—Dr. A. H. Thompson, Lond.; Dr. H. H. Tooth, C.B., C.M.G., Lond.; Dr. W. W. C. Topley, Lond.; Mr. G. Tyrrell, Lond.
W.—Dr. G. Ward, Lond.; Dr. V. G. Ward, West Byfleet; Dr. D. Walsh, Lond.; Mr. R. L. M. Wallis, Lond., Mr. F. T. Wheatley, Sheffield.

Communications relating to editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C.2.

Notes, Short Comments, and Answers to Correspondents.

THE BATHS OF OLD LONDON.[1]

BY SEPTIMUS SUNDERLAND, M.D. BRUX.,
CONSULTING PHYSICIAN, ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN; OBSTETRIC PHYSICIAN TO THE FRENCH HOSPITAL.

PART I.

"The City of the Waters."

I LIKE to believe that the meaning of the word London is "The City of the Waters," after the derivation put forward by Mr. W. Owen, F.S.A., editor of "Welsh Archæology"—namely, Llyn, meaning a lake or broad expanse of water, and Dyn, meaning a town. Another derivation is Lhong, a ship, and Dun, a town—"the town of ships." On considering the situation of London on the Thames, with its numerous tributaries taking their origin on the hills both north and south of the Thames valley, one can understand that the lands around the town were in former years dotted with springs and pools.

I may remind you of a quaint quotation taken from a translation of the "History of London," written in 1180 by William Fitzstephen, a Canterbury monk and the friend of Beckett:—

"Round the city again, and towards the North arise certain excellent springs at a small distance, whose waters are sweet, salubrious, and clear, and whose runnels murmur o'er the shining stones; amongst these Holywell (Shoreditch), Clerkenwell, and St. Clement's Well may be esteemed the principal, as being much most frequented, both by the scholars from the school (Westminster) and the youths from the city, when in a summer's evening they are disposed to take an airing."

And another quotation from the "Survey of London," by John Stowe, the English antiquary and historical writer of the sixteenth century, who, referring to the thirteenth century, says:—

"They had in every street and lane of the city divers fair wells and springs; and after this manner was this city then served with sweet and fresh waters which being since decayed, other means have been started to supply the want."

These quotations bring vividly to the imagination the existence in the early days of streams, ponds, pools, wells, and springs, not only on the north side, but on the south side in Southwark, Lambeth, and contiguous neighbourhoods. Most of the pools have been filled in and the springs and streams diverted into sewers.

Thus one knows that in very early days before Fitzstephen's and after Stowe's time there must have been no lack of facilities for bathing in the open.

The names of many streets will indicate to what extent the existence of water affected the nomenclature of the districts—e.g.: Bath-street (Newgate-street), Bayswater-road, W., Brook-green, Hammersmith.

Olden Baths of London.

One of the most interesting amongst the olden baths of London is the Old Roman Spring Bath (or Plunge Bath), situated near King's College, Strand, because this bath still remains as one of the few relics of Roman London. It was probably built about 2000 years ago, in the time of Titus or Vespasian. It is supplied with clear water coming from springs at Hampstead, and was considered to be the overflow from St. Clement's Holy Well in the vicinity. The bath, rounded at one end and square at the other, is in the centre of a fair-sized, solidly built, vaulted chamber, and lit by a little semicircular window. Its length is 13 ft., breadth 6 ft., and depth 4 ft. 6 in. Charles Dickens refers to this bath in "David Copperfield."

The Templars' Bath or Lord Essex's Bath. Adjoining the Roman Bath and deriving its water-supply from it was another bath, of octagonal shape, the Templars' Bath, used for three centuries by residents in the Temple and closed in 1893. It was built in 1588 by the Earl of Essex, whose house was near. The site is now covered by the larder of the Norfolk Hotel.

St. Agnes-le-Clair Bath was situated on the site now named St. Agnes-terrace, near St. Luke's Hospital, Old-street, and is considered to have been first used in 1502, being supplied by the St. Agnes-le-Clair spring (one of the holy wells of London), although a Roman origin was at one time claimed for it; for in the eighteenth century many ancient copper coins, Roman relics, and other antiquities were discovered in the bath, as well as Roman tiles. Some writers consider these were brought thither and cast into the spring as votive offerings. The spring was dedicated to St. Agnes and called "le Clair" on account of the transparency of its waters. Stowe speaks of them

[1] A paper read before the London Dermatological Society in an abridged form.

as "Dame Anne's the clear." An advertisement in 1758 speaks of the bath as being "much applauded by the learned physicians of old" "in rheumatic and nervous cases and headache, and for cutaneous eruptions and inflamed eyes." In 1854 the Bath House was damaged by fire and the bath came into disuse.

The Peerless Pool, Baldwin-street, City-road, behind St. Luke's Hospital, was referred to by Stowe as "one other clear water, called Perilous Pond, because divers youths by swimming therein have been drowned." It was enclosed in 1743 by Wm. Kemp, a London jeweller, who changed its name to Peerless Pool and used it as a bathing place. Fed by springs, this open air pool measured 170 ft. in length, 108 ft. in breadth, and from 3 to 5 ft. in depth. It was nearly surrounded by trees and marble steps led to a gravel bottom, through which springs percolated. It became a favourite resort of anglers and swimmers. Peerless Pool was used as a bath until about 1850, when it was drained and built over, and its name is commemorated by Bath Buildings, Peerless-street, and Bath-street, to the north and west of St. Luke's Hospital.

The Cold Bath in the New (Euston) Road was situated near the old Adam and Eve Tea Gardens at the north-west end of Tottenham Court-road. The bath was in a pleasant garden and was supplied by a spring. The water was described as being "beneficial to persons suffering from nervous disorders and dejected spirits." It was in existence in 1785, and was then advertised as being "in fine order for the reception of ladies and gentlemen."

The Cold Bath, Clerkenwell, situated near the River Fleet, or, as it was then called, Turnmill Brook, not far from the spot where the Clerks' Well existed (near the present 18, Farringdon-street), was a cold spring which, in 1697, was converted into a bath by the owner of the surrounding property, Walter Baynes, and was described as the "most noted and first about London." The charge for bathing was 2*s.* or 2*s.* 6*d.* if use were made of the chair suspended from the ceiling for lowering the patient into the water. The water of the spring used for drinking and bathing was chalybeate, and was considered efficacious in the cure of "scorbutic complaints, rheumatism, chronic disorders, &c." It was also considered to "prevent and cure cold, create appetite, help digestion, and make hardy the tenderest constitutions." The bath was at the height of its reputation in 1700. The bath was enclosed in a building known as Coldbath House, surrounded by a garden with four turret summer-houses. The spring supplied 20,000 gallons daily. In 1815 most of the exterior of the bath-house was removed to make way for buildings, but the bath itself remained as late as 1870 (Macpherson). I believe there is now no trace of its existence. The neighbourhood was formerly known as Coldbath Fields.

Sun Tavern Gap, at Shadwell, marks the spot where a spring was discovered in 1745, which was puffed by D. W. Linden, M.D., in 1749, "for scorbutic and cutaneous disorders by drinking or bathing." It was used medicinally only for a short period, and was known as "Shadwell Spa"; the water was sold at the Spa House in Sun Tavern.

Queen Anne's Bath was situated at the back of the present No. 35, Endell-street, Long Acre. The waters were supplied from a copious spring containing iron, and were used for rheumatism and other disorders. It is said that Queen Anne used to bathe there; small rooms at the side used to be shown as her toilette and dressing-rooms. The bath-chamber was about 14 ft. square, with a lofty groined dome roof, and its walls inlaid with white and blue Dutch tiles of the sixteenth century.

The New Spa, Hampstead, was first mentioned in 1804 by a local practitioner, Thomas Goodwin, in a pamphlet entitled "An Account of the Neutral Saline Waters Lately Discovered at Hampstead." The water contained magnesium sulphate and a bath-house existed for the immersion of patients in the water from the spring. This "New Spa" had very little success. The site was near the present railway station of the L. & N.W. Railway.

(To be continued.)

COLONIAL HEALTH REPORTS.

Uganda.—According to the Blue-book for the year 1917–18, the population of this Protectorate is estimated at 3,360,439, including 570 Europeans and 3467 Asiatics. In 1917 the cases treated in Government hospitals and dispensaries numbered 70,236, with 967 deaths, these figures not including cases treated at the military hospitals at Entebbe, Bombo, and Gulu. The number of European officials resident was 378, among whom there occurred 359 cases of illness and 2 deaths. Of the total admissions to hospital 112 were due to malaria and 11 to dysentery; 8 European officials were invalided, bringing the total number during the last seven years to 30; the causes of invaliding were general debility, neurasthenia, tuberculosis, and neuritis. The number of cases treated at European and native Government hospitals decreased from 5679, with 20 deaths in 1916, to 4414 cases with 6 deaths in 1917. Forty-nine cases of blackwater fever were treated, of which 8 were fatal, compared with 46 cases and 10 deaths in the previous year. The diseases which call for special attention in connexion with the native population are cerebro-spinal meningitis, sleeping sickness, plague, small-pox, and venereal diseases. Cases of cerebro-spinal meningitis treated in Government hospitals have risen from 4 cases with 3 deaths in 1915 to 71 cases with 42 deaths in 1916, and 469 cases with 347 deaths in 1917. Besides these numerous deaths have taken place all over the country, cases having been reported in every district except Masaka. The disease has been particularly severe in the northern and north-eastern parts of the Protectorate. It is estimated that not fewer than 5000 deaths took place from this disease in the districts of Gulu and Kitgum, whilst in the Arua District of the West Nile it is considered that 3000 natives have died from the same cause. The rapid spreading of this disease and the great number of deaths are due, first, to the abnormal collection and movements of natives for military purposes, and, secondly, to the shortage of the medical staff. Epidemics of small-pox occurred throughout the Protectorate, the Nile Districts and Lango being specially affected, and towards the end of the year the mortality was severe. Admissions of cases of plague to hospital show a decrease from 321 cases with 283 deaths in 1916 to 171 with 143 deaths in 1917, and the native returns show a slight decrease in the number of deaths compared with the previous year. The local sanitary boards are working in the various townships with good results, and anti-malarial measures improve the conditions of the more important stations.

THE KENSINGTON WAR HOSPITAL SUPPLY DEPOT.

THE depôt was registered in 1916 under the War Charities Act, and during the war has turned out over 6,000,000 articles, valued at £300,000, which have been sent to 1400 different hospitals at home and abroad. In a List of Surgical Appliances and Hospital Requisites issued (at 2*s.*) by the depôt, among the many useful appliances may be noticed: a finger flexion glove, consisting of a leather wristlet with splint and glove attached—from each finger of the glove extends a strap which can be fastened to a button on the wristlet; a Hey Groves humerus extension splint which can also be used as a stump tractor; a simple type of wood splint for extension of the forearm; a Bowlby's slung leg splint for dressing wounds of the calf without disturbing a fractured limb. Many forms of pilons are illustrated; they can be obtained either with belts for cases of thigh amputation or with gauntlets above the knee for amputations lower down. The work of the depôt is now being reconstructed to deal with civil hospitals and patients.

A PSYCHOLOGICAL STUDY OF THE PRISONER OF WAR.

Dr. A. L. Vischer, a citizen of a neutral country with a command of three European languages, has had a unique opportunity of visiting the great European internment camps and of investigating the mental changes—we should like to call them the metapsychoses—for which the conditions of internment are responsible. It will be realised when reading his book on Barbed Wire Disease [1] that he has made full use of his opportunities, and in addition has read widely in the literature produced by interned authors. If he has paid less attention to English writers than to French and German authors the deficiency has been realised and amply redeemed in the very able introductory chapter by Dr. Kinnier Wilson. There is far more than the loss of liberty to prey upon the minds of the internés. Uncertainty of the future, the loss of privacy, and nostalgia, aggravated by the restrictions in correspondence, all play their part, but above all, the authors lay emphasis on the constant menacing mockery of the barbed wire entanglements. As one of the men in Knockaloe Camp has written, "Physically the prisoner is powerless, but in spirit he gnaws unceasingly at the roots of the thorny hedge."

What are the consequences which are observed to follow upon these changes in the prisoners' mental life? Their dreams, their irritabilities, their depression, the exaggeration of rumour, and the gradual starvation of libido have all been noted and recorded by Dr. Vischer, who has also inquired into the origins of these phenomena, their development, and the prospects of their elimination when the causative factors have been removed. The mental syndrome of the interné is then usefully compared with the experiences of others who in time of peace have found themselves "closely confined for an indefinite period." This is often the case with the crews of sailing vessels on long voyages, with polar and other explorers, and those who have chosen to live the monastic life. The book is suggestive rather than dogmatic and will be read with interest by all who are concerning themselves with the development of the science of abnormal psychology.

[1] Barbed Wire Disease: A Psychological Study of the Prisoner of War. By A. L. Vischer, M.D. Basle, M.R.C.S. Eng. With an Introductory Chapter, by S. A. Kinnier Wilson, M.A., B.Sc., M.D. Edin., F.R.C.P. Lond. London: John Bale, Sons and Danielsson, Ltd. 1919. Pp. 84. Price 3*s.* 6*d.*